DEVELOPMENT THE A DISPUTE RESOLUTION FRAMEWORK TO IMPROVE THE EFFICIENCY OF DISPUTE RESOLUTION IN SAUDI CONSTRUCTION PROJECTS

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Abstract

The Kingdom of Saudi Arabia (KSA) has the one of the fastest growing economies in the Middle East, and the construction sector in the KSA has become the largest construction sector in the Middle East. This sector incorporates a variety of building, housing and infrastructure related projects and, over the past two decades, has witnessed an increase in the number of disputes. Such disputes impact the time, cost and quality of the work and may even cause projects to come to a halt. Resolving disputes takes a long time in Asia and Middle East, and they effect on the relationships between the parties involved. Industry reports suggests phenomenonal costs of these disputes, costing industry hugely in terms of productivity and efficiency.

However, there is a clear knowledge gap in the research, in that none focuses on dispute resolution in Saudi construction projects, including the critical success factors for alternative dispute resolutions and the barriers to using alternative dispute resolutions. Thus, the main aim of this research is to improve the efficiency of dispute resolution in Saudi construction projects through the development of a dispute resolution framework. To achieve this aim, the researcher collected data through mixed, qualitative and quantitative methods. The researcher conducted semi-structured interviews with 15 academics, arbitrators and experts in Saudi construction projects. These interviews were conducted face-to-face, by telephone and through Skype. The researcher used manual coding for content analysis and later used Survey Monkey to conduct a survey and collected data through social networks and face to face.

According to the collected data, the primary causes of disputes in Saudi construction projects are financial, contractual, or related to the owner, the design, the contractor, behavior; disputes may be project-related and external. It is also found that the methods used to resolve disputes in the public sector are different from those used in the private sector. The methods of dispute resolution include negotiation, mediation, arbitration and litigation. In the public sector, litigation is often used, but it is rarely to use negotiation. In private sector, negotiation, mediation, arbitration and litigation are used, and the most used method is litigation. The researcher also identified four main barriers to alternative dispute resolution in Saudi construction projects: governmental, contractual, cultural and developmental, and rehabilitation. The researcher develops a disputes resolutions framework through interviews with academics, arbitrators and experts and by using interpretive structural modeling (ISM) to evaluate the critical success factors in alternative dispute resolution, through relative ranking between the factors. This research has several limitations, included limited literature, data collection and identifying the current conditions of Saudi construction projects. There are four contributions in this research; firstly, the study explored the current methods of dispute resolution in Saudi construction projects based on qualitative data, which conducted on 15 experts, arbitrators and academics. Secondly, the study provided

ranking and rating between factors based on the quantitative data, which conducted with 327, responds. Thirdly, the study provided CSF ISM model that contributed to the understanding of the relationship between critical successful factors for alternative dispute solutions in Saudi construction projects. Forth, Development of dispute resolution framework is to improve efficiency of dispute resolution in Saudi Construction Projects. Finally, made recommendations for both academic and industrial sectors KSA.

Key words: Causes of disputes, Dispute resolution Method, Critical Success Factors, Saudi Construction Project management and Interpretive Structural Modeling

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List of publications

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Acronyms

AALCO	Asian African Legal Consultative Organisation
ADR	Alternative dispute resolution
CEO	Consulting Engineering Office
DAB	Dispute Adjudication Board
DRB	Dispute Review Board
DRM	Disputes Resolution Method
FIDIC	International Federation of Consulting Engineer
GCC	Gulf Cooperation Council
GDP	Gross Domestic Product
ICA	International Court of Arbitration
ICA	International Commercial Arbitration
IMF	International Monetary Fund
ISM	Interpretive Structural Modelling
KSA	Kingdom of Saudi Arabia
LCIA	London Court of International Arbitration
PWC	Public Work Contract
SAR	Saudi Arabian Riyal
SCE	Saudi Council of Engineers
SCP	Saudi Construction Project
UK	United Kingdom
US	United State
YoY	Year-one Year

Chapter 1. Introduction

1.1 Introduction

This chapter presents research background, rationale of research, followed by aim and objectives. Key literature is presented, in the area of disputes resolution. Need for this research is highlighted, followed by discussion on research aim and objectives. Scope and limitation of the study is also discussed. The chapter also contains an illustration of the expected research contributions and structure of the thesis and the research gap is viewed substantially in relation to the literature on dispute resolution in construction project.

1.2 Research Background

Being one of the significant industries of the modern age, the construction industry sector has a great impact on the economy of each and every country. On an average, it accounts for nearly 8-10% of the Gross Domestic Product (GDP) (Mawhinney, 2001). In the views of Ng et al. (2007), 55 of the most developed countries in the world invest approximately a total of one trillion dollars on construction and reconstruction of their civil structures. The sector is considered to be pivotal for the economic progress of the country and investment done in the construction sector has a substantial impact on all other sectors of the economy. The industry is expected to grow by 67 per cent up to £7.69 trillion by the end of 2020, representing 13.2 per cent of the world's GDP. The total accumulated expenditure of the construction industry worldwide is expected to be £62.65 trillion during this decade (Hook, 2011). This indicates that the global construction industry continues to grow, despite the current economic downturn.

Likewise, Kingdom of Saudi Arabia (KSA) has a thriving construction sector, one of the largest in the region. The country's huge oil reserves generate considerable revenue, thereby enabling rapid advancement and modernization of the Saudi Arabian economy (Loosemore, 2003). KSA is the largest petroleum exporter, with 18% of global petroleum reserves (OPEC, 2013), making it one of the most upcoming and fastest growing economies in the Middle Eastern region. The construction sector in Saudi Arabia has become the "largest construction sector in the Middle East and remains a 'construction safe heaven' amid both wider political and financial turmoil" (GCC, 2013). Additional factors that enhance the economic growth in Saudi Arabia include religious tourism, the mortgage laws that are soon to be adopted and recently implemented city development strategies (SAMA, 2013).

The construction sector incorporates a variety of divergent projects based on structure and planning. The lack of standardization and a set methodology are the prime characteristics of the industry. There are a number of technical experts and engineers involved, in the development and planning process of construction projects. Therefore, coordination, timely dispute resolution and effective teamwork play a vital role in the successful implementation of such projects. The construction of civil structures usually involves a considerable period of time, thereby affecting long-term planning and estimated demand-supply for such projects (Wood, 2001). According to Yiu and Cheung (2006), there is a likelihood of numerous disputes due to the conflicting interests of various parties involved in the project.

Disputes might adversely affect the interest of many stakeholders, resulting in decreased profitability and increase in the overall expenditure (Awakul & Ogunlana, 2002). Lack of research dominates the construction industry in Saudi Arabia with respect to disputes. Fenn (2007) has acknowledged a significant gap in terms of the knowledge available on the sources, cause and effects of disputes in the construction industry. Serious disputes concerning construction contracts have become increasingly common within KSA, where the construction industry is one of the key economic sectors (Jannadia et al, 2000). However, it suffers some major problems that affect its role in building up the national economy. Assaf et al. (1995) found and reported that contract disputes were one of the main causes of delay in large building projects in KSA.

Alsharif (2013) pointed that more than three millions SAR is the cost of disputes because of contractual disputes in Saudi construction projects. Such a volume of disputes need to be explored and understood. So that, the affect of causes of disputes and type of disputes causes could be investigated. In addition, it is important to explore the method of disputes resolution and determine critical success factors for alternative dispute resolution. Also it is important to determine barriers to the use alternative dispute resolution of Saudi construction project in the private and public sectors where it can be studied and documented. Jannadia (2002) has indicated that serious disputes concerning construction contracts have become increasingly common over the last two decades within Saudi Arabia and Alrby'ah has noted that in 2007, 60% of litigation in Shari'ah courts (Saudi Arabia's legal system).

In summary, research background is based on literature review. It focuses mainly on four areas of research: type causes of dispute, methods of dispute resolution, critical success factors for alternative dispute resolution and barriers from used the alternative dispute resolution. Type of disputes (Cakmak and Cakmak, 2013), causes of disputes (Kumaraswamy, 1997), methods of dispute resolution (Murdoch and Hughes, 2008), critical success factors for alternative dispute resolution (Harmon, 2001; Harmon, 2002) and barriers from used the alternative dispute resolution (Abdullah, 2015).

1.3 Justification of Research

The delay resulting from the acts of the stakeholders may cause great disputes and conflicts among the various parties in Saudi public and private sector construction projects (Assaf and Al-Hejji, 2005). The disputes, if not resolved at the early stage, may become an impediment to the effective completion of the project. Similar difficulties have been observed in the Saudi construction sector. According to Fenn (2007), plenty of valuable resources are dissipated due to the repeated occurrences of disputes during the project. Besides increasing the duration of the construction project, they also lead to an increase in the overall expenditure and disruption of healthy relationships between key project stakeholders.

The literature review deals with the rising incidence of construction disputes across the world. As reported by (Allen et al., 2013), the number of disputes in the construction sector globally is witnessing an upward trend, leading to cost and time overruns primarily due to the time involved in resolving them. It took nearly 10 months to resolve a dispute in 2011, while the time limit increased to 12 months in 2012. The trend clearly reflects the rising incidence of disputes, with an average time of 9 months to resolves disputes in 2010 Allen (Allen et al., 2013). Fortunately, though the time involved has reduced, the average value of construction disputes has fallen as well, from US $32.2 million in 2011 to US $31.7 million.

In contract, the average time taken to resolve the disputes has risen in Asia, the Middle East and UK. As per the data of 2012, the disputes in the Middle East take the longest time to resolve i.e. around 14 months, while it takes around 14 months in Asia. In comparison, the disputes in the US (11 months) and Europe take a relatively lesser time to resolve (Table 1-1). Analysis of the data for 2012 reveals that though the number of disputes fell across all the regions, the disputes in the Middle East were still highest in number averaging around US $65 million. As the trend for heavy expenditure in the construction sector in Asia and Middle East is likely to

continue for years to come, the possibility for high volume of disputes cannot be overruled (Allen et al., 2013).

The past two decades in the construction sector has witnessed an increasing trend in the level of disputes. Huge loss of money, effort and time are the grave consequences of such disputes. The KSA construction sector presents an ideal example of the problem (Jannadia et al., 2000). Further, Fenn (2007) pointed out that there is not much research done in the subject area of dispute resolution in the construction sector, thus, increasing the scope for investigation. That could deal with disputes with the approach leads to a better solution to this by identifying the types and causes of disputes by which they can find the method of disputes resolution and identify the critical success factors affecting for alternative dispute resolution and barriers that prevent using the alternative dispute resolution.

Jannadia (2000) investigated different types causes of disputes prevalent in KSA. He concluded that disputes have become increasingly common since the 1980s. For example, in 2006, 45% of the litigation cases within the Shari'ah courts and the Board of Grievances were concerned with construction disputes or projects (Al-Rabiah, 2006). Review of cases dealt by Saudi Ministry of Justice (2014) indicates a similar trend, with an increase in the number of issues related to construction sector. According to Ministry of Justice in KSA (2014) data, 1205 disputes related to construction projects were brought forth, whereas in 2013, this number was 1074. This data related to key dispute issues in five main cities of Riyadh, Jeddah, Makkah, Madinah and Dammam (Ministry of Justice, 2014).

Disputes are very expensive and consume tremendous amount of resources. Alshehri (2013) spoke largely on the sources of conflict and he recommended that there should be discussions about the search to resolve the dispute and conflict in projects in Saudi Arabia. Industry experts believe that construction litigation has caused losses of about £5 billion (Alasamri et al., 2012) within Saudi Arabia. Considering the fact that the industry is increasing by ten percent every year, it is of no surprise that the industry has been labelled as a dispute-ridden industry.

Table 1-1: Global construction Disputes Data (Allen et al., 2013).

Region	Dispute values (US$ millions)			Length of dispute (months)		
	2010	2011	2012	2010	2011	2012
Middle East	56.3	112.5	65	8	9	14
Asia	64.5	53.1	39.7	11	12	14
US	64.5	10.5	9	11	14	11
UK	7.5	10.2	27	6	8	12
Mainland Europe	33.3	35.1	25	10	11	6
Global Average	35.1	32.2	31.7	9	10	12

KSA provided a unique construction environment, with a heavy reliance on foreign contractors and immigrant workforce. Literature review indicates that there have been no clear industry-specific policies and guidelines on how construction disputes involving the State and foreign contractors should be dealt with in KSA, including no attempt to emerge with adequate explanations and solutions to deal with disputes. It can be argued within KSA construction industry, best practices to solve disputes cannot be imported as it is, from other countries due to unique working culture, polices and procedures used in KSA Also, there is dearth of published research and information to help understanding the problem and providing practical framework to help solving dispute issues in construction industry. This research study focuses on addressing aforementioned concerns, and make recommendations for effective measures to improve future performance of the construction projects leading to fewer disputes. A clearly laid out framework analysing various factors contributing to disputes will help enhance transparency in the disputes resolution process. For foreign contractors, international arbitration may not necessarily be the most cost-effective and useful means of resolving disputes. Considering and encouraging dispute resolution methods, lead to a reduction in costs and delays and the preservation of business relationships.

1.4 Research Questions

This research aim to answer following research questions:

1. What is the impact of disputes and type causes of disputes in Saudi Construction projects?
2. What is existing practice of dispute resolution within Saudi Construction Projects?
3. What are the Critical Success Factors for Alternative dispute resolution and the challenges using the Alternative dispute resolution in Saudi Construction Project?
4. How could we improve efficiency of dispute resolution through identifying the type causes of disputes and critical success factors for alternative dispute resolution?

1.5 Research Aim and Objectives

From the questions emerging from the literature review, this research aim to develop dispute resolution framework to improve the efficiency of resolving disputes in Saudi construction projects. From this, the following research objectives have been set:

1. To identify the impact of disputes and type causes of disputes in Saudi Construction projects.
2. To explore the existing practice of the method of dispute resolution in Saudi construction project.
3. To investigate Critical Success Factors for alternative dispute resolution and barriers to alternative dispute resolution usage to solve disputes in Saudi Construction Projects.
4. To develop dispute resolution framework to improve the efficiency of method of disputes resolution in Saudi construction projects.
5. To evaluate and validate the dispute resolution framework in Saudi construction projects through ISM and academics, arbitrators and experts feedback.
6. To provide recommendations on the best method of dispute resolution in Saudi Construction Projects.

1.6 Scope of the Research and Limitation

The scope of the study is described in this section with respect to the impact of type and causes of disputes, dispute resolution method, the critical sucess factors for alternative dispute resolution and the barriers using the alternative dispute resolution, parties involved, projects and actual locations.

This research is focusing mainly on type of causes of dispute, method of dispute resolution, the critical success factors for alternative dispute resolution and the relation between them in the Saudi construction projects. The project is also considered with large project size project of the public industry. The main drives for this scope is that the main disputes occur on large project size on Saudi construction project in public and private sector.

This research was conducted solely within the context of Saudi Arabia; specifically, the study focuses on disputes in public and private Saudi construction projects. The main research limitations of this research include (I) focusing only on Saudi construction Project in Saudi Council of Engineers (II) number of companies involved in the survey are limited (III) KSA is

a large country with several companies and government institutions, the research was focusing on Saudi Council of Engineers.

1.7 Expected Contribution to Knowledge

Existing studies on disputes don't adequately address specifics social-political problems specifics to KSA context. Where KSA legal system is different from legal systems used else where in the world. Additionally, this research helps to develop a better understanding of contemporary challenges and perspectives of the Saudi expert. The main contributions of this research are, firstly, to the field of dispute resolution practice in Saudi construction projects. The study will contribute to the body of knowledge in the field of method of dispute resolution in relation to Saudi construction projects.

The study provides descriptive data analysis on the affects of disputes on time, cost and quality. It also offers insights into existing dispute resolution processes and the causes of disputes. Method of dispute resolution framework has been developed to improve the efficiency of disputes resolution by identifying the critical success factors for alternative dispute resolution and also the barriers that prevent using the alternative dispute resolution in Saudi construction project.

1.8 Outline of the Research Methodology

The research methodology assists in providing a clear understanding of the dispute resolution method by developing method of dispute resolution in Saudi Construction Project. Mixed method approach will be adopted in this research. Qualitative data from key personnel of Saudi Construction Project will be collected data based on face-to-face interview. This is needed to identify and explore key issues of current Causes of dispute issues and their opinions and views on the main Dispute Resolution method and the critical success factors for alternative dispute resolution and finally the barriers for alternative dispute resolution. Collecting quantitative data will be collected through designing semi-structure questionnaire. The questionnaire was needed to survey large number of construction employees to identify their opinions and views on the current construction dispute resolution method and causes of disputes and main criteria for developing framework. Both quantitative and qualitative data with main outcomes of the literature review will be used in developing the research framework model. The framework has been developed based on the views and opinions of arbitrators, academics, and experts as well as using ISM model to understand the relationships between critical success factors for alternative dispute resolution in Saudi construction projects.

1.9 Structure of the thesis

Chapter 1. Introduction: It is a brief overview of the research study, specifically covering the research problem, the aim and objectives and the research methodology and procedure and thus, laying the foundation for all further discussions Scope and limitation of the study is also discussed The chapter also contains the outline of the expected research contributions.

Chapter 2. Dispute in Construction projects -: This chapter deals with the literature on disputes relating to the Saudi construction project public and private sector focusing on a review on of impact and causes of disputes and method of dispute resolution and the critical success factor for the alternative dispute resolution and barriers.

Chapter 3. Overview of disputes in the context of Saudi Construction industry: It focuses on the Saudi construction project including the Middle East countries and construction, the background of Saudi, the Saudi of economy, the Saudi construction project, the procurements in Saudi, the contracts in Saudi, the conflicts, claims and disputes in Saudi, the method of dispute resolution in Saudi and finally the Saudi council of engineers.

Chapter 4. Research Methodology: The section discusses the methodology and philosophy of the research. It further elaborates the various procedures used for conducting research and justification for adopting the methods, and how data has been collected and questions answered.

Chapter 5. Qualitative Data and Analysis: This stage focuses on the qualitative aspects of the conducted for the purpose of the research study. It further identifies the best practices being followed by the interviewed academics and experts and arbitrators through which focusing on the current situation in Saudi construction project.

Chapter 6. Quantitative Data and Analysis: presents the results of the quantitative of the conducted around the present state of disputes, analysing the of various of type causes of disputes and the method of dispute resolution and the critical success factors for alternative dispute resolution and the barriers parent using the alternative dispute resolution.

Chapter 7: Model of Critical Success Factors: The model developed by using by ISM to support the evaluation of critical success factors for alternative dispute resolution through finding the relation and ranking between factors.

Chapter 8: Development of the Dispute resolution Framework and Validation: This Chapter focuses on the development of dispute resolution framework to improve the efficiency dispute resolution in Saudi construction project based on the analyse the quantitative and qualitative findings of the research study. This is followed by the validation of the qualitative and quantitative data obtained through the academics, arbitrators and expert feedback.

Chapter 9. Discussions and Conclusions, Recommendations: It presents the linking between the findings of the previous chapters in the form of a detailed framework. This section highlights the conclusions and recommendations of the research study and the contribution of the dispute resolution framework in construction sector in KAS.

Chapter 2. Dispute in Construction projects

2.1 Introduction

Herein it is proposed to focus on the examination of the process of dispute resolution in the construction projects, and as such it is necessary to review the academic literature in this area of the practical application of law to determine methods of avoidance of conflict and effective settlement. The consideration of practical approaches will outline the process by which this research is conducted, particularly into areas where there has, in the opinion of the author, been insufficient prior analysis of construction project based disputes. In the course of this examination, the limited availability of academic research into this particular field of conflict resolution has been apparent which this study can seek to assess and address. The first section of this thesis will consider the range of concepts and definitions of disputes, followed, in Section II, by an assessment of the impact of disputes on a construction project. Section III will define the differing types and causes of disputes, and, in section IV, analyse the effectiveness of current methods of dispute. Thereafter, it will be pertinent, in Section V to assess the critical success factors for alternative dispute resolution. Finally, the barriers to the use of alternative dispute resolution processes will be examined and their success in construction dispute conflicts assessed with proposals for improvement.

2.2 Definitions

Parties working in the construction sector remain confused in the identification of differences in the actual terminology related to construction conflicts (Yates *et al.*, 2003). It is therefore attempted in this section to provide an overview of such vocabulary as conflict, claims, disputes and dispute avoidance, to facilitate understanding of how these words are generally utilised by construction professionals.

2.2.1 Conflicts

Simply, conflict can be described as the opposing interests of two or more parties in the aim and conduct of a project agreement (Whitfield, 2012). Although many are capable of resolution in a relatively harmonious manner, often by discussion and persuasion, they can be exacerbated as a result of the prior relationship difficulties between parties (Kumaraswamy, 1997). Fenn *et al* (1997) state that conflict and dispute resolution should be viewed as two distinct stages, where an issue of incompatibility of interests occurs, and thereafter conflict is be managed, with

the intent that escalation and harm to the project is prevented. In the construction industry, Yiu and Cheung (2006) consider that conflicts will be inevitable due to the existence of inherent differences of interests between the different parties involved. Conflicts of interest are most commonly considered to be the main driver of disputes and occur when there is a difference in approach, behaviour or even time or place between the parties (Chan, 2008). This is the perspective, which is adopted by the author in the conduct of this study.

2.2.2 Claims

Claims are distinguished in the contexts of (i) "claim entitlement" and (ii) a "claim for breach of contract"; the first refers to those made within the operation of the contract, which are not disputed, generally form part of the obligations, and do not result in a dispute, and the other a breach of the agreement by one or more party (Love et al., 2008). Eaton et al., 2006 states that should a dispute result in a formal complaint or legal proceedings they will become both time-consuming and costly, emphasising the need for avoidance. Studies on the classification of construction disputes by contractors against clients in the UK, USA and Commonwealth conclude that there are two main legal bases for financial claims (Wallace, 1986; Yogeswaran, 1997). The first is described as a claim for damages for breaches of contract by the employer. These may be subdivided into (i) breaches affecting contract performance but where the project proceeds to completion, (ii) those which result in contract termination before completion, and (iii) breaches of the payment obligations of the employees. Secondly, additional payments may become due under a section of the contract provisions, where they facilitate variations, measurements in unit-price contracts, and those due under contractual miscellaneous provisions such as price variations and physical conditions (Wallace, 1986; Yogeswaran, 1997).

Ndekurgi and Rycroft (2009) identify four legal bases for claims under a contract in construction projects. The first is that the contractor may submit a claim that is expressly authorised in the agreement that involves a particular piece of work being executed. In this case, the claim is often for expense or loss. Secondly, the basis of a claim may be as a result of a breach of legal duty or contract, which results in a significant amount of damage. Where a successful claim is made under such common law categories relating to contractual obligations, the party which suffers loss is entitled to unliquidated damages. In the third type of claim, a party may seek restitution for loss as a result of breach of duty, and finally, some construction law texts cite ex gratia claims.

Time is a crucial factor in construction projects, in the performance of obligations, especially where they must be completed within an agreed period. In English common law, a contract condition such as a clear and specified completion date is a physical for a breach of that condition to offer a pretext for legal action (Sims and Bunch, 2003). According to Arditi and Patel (1989), a construction claim for compensation may be described as a demand by a contractor for final reimbursement for further work in addition to that initially contracted for, or costs which result from actions not foreseen in the original agreement which causes delay.

2.2.3 Disputes

Black (2009) defines dispute is a controversy or conflict of rights or claims, an assertion of a demand, right or claim by one party which is met by converse allegations or claims by another. Reid and Ellis (2007) however suggest that as a result of a lack of a definitive meaning of the term 'dispute', there is a gap in the necessary understanding of the concept. Yates (2003) therefore defines a dispute more simply, stating that it is a claim which is not resolved between two or more parties, and is thus escalated. This is problematic for each party involved, because, as noted by Gould *et al.* (1999) and Fenn (2007), such disputes are both time consuming and costly to the involved parties, and additionally jeopardise a constructive and amicable relationship between the parties.

As such, a clear distinction can be made between a 'dispute' and a 'claim'. Hibberd and Newman (1999) argue that whereas a claim is a declaration of a contractual right, this does not necessarily lead to a dispute unless such a claim is rejected. It is therefore more constructive to the continuation of the contractual relationship that resolution is actively pursued at the earliest stage. Numerous scholars have further highlighted the fact that in the construction industry, disputes are virtually unavoidable due to the complex and expensive nature of negotiation and performance (Hellard, 1988; Campbell, 1997; Fenn *et al.*, 1997). Evidently, therefore, the differing interpretations of terminology, regarding 'conflicts', 'claims' and 'disputes' should be particularly addressed in construction industry contractual relationships given that the meaning of each type of issue has different methods of resolution technique to avoid escalation figure 2.1 shows the method which explains that because of conflict occurs, claims and disputes happen.

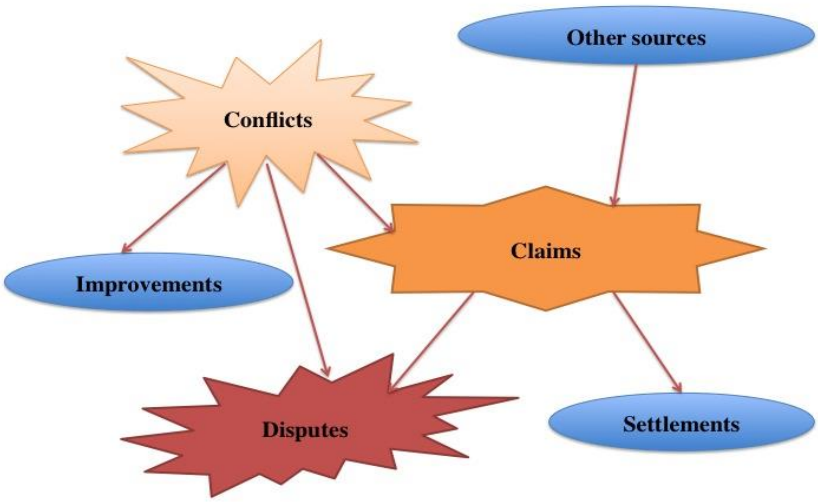


Figure 2-1: Relationships between Conflict, Claims, and Disputes (Adapted from Kumaraswamy 1997)

2.2.4 Dispute Avoidance

The establishment of definitions assists in determining the most effective choice of method to avoid the development of a dispute to an expensive stage which harms the progress of the project. Kirk (2003) states that effective mechanisms are required to identify possible conflicts at early stages of potential disagreement to facilitate the control of disputes and minimise costs by avoidance. Such techniques often focus on ensuring that documentation pertinent to the disagreement is available and disclosed, schedules and costs are controlled, quality is managed and the relationship is maintained (Ng *et al.*, 2007). Researchers have attempted to explore factors and causes of conflicts, to identify and determine the application of a variety of conflict resolution and avoidance strategies specific to the industry (Im, 2006; Stanslaus, 2011). There has been a more recent shift towards dispute avoidance and minimisation in the form of review boards and resolution advisors in the construction industry (Ng *et al.*, 2006 ; Wall, 1994). Perhaps it can also be considered that the most adequate and efficient way of coping with the risk of disputes is through avoiding them altogether, where possible (*Stets et al.*, 1991).

2.3 Impact of Disputes on Construction Projects

Disputes between parties will inevitably have a significant impact on construction projects in terms of the consumption of unremunerated time, escalating cost and potential compromise in the quality of the project, as well as the relationship between the parties. In terms of seeking such damaging implications, they must be controlled at the stage where arguably resolution is

more simply achieved, namely their inception. The construction industry is said, amongst all industries, to lose most in terms of time as a result of industrial disputes (Gutierrez et al., 2013). Furthermore, a study in UK by (Blake et al., 2014). found that the most significant contributing factors to disputes are schedule and cost overruns. It is now evident that the Middle East is now reporting the highest levels of cost disputes in the construction industry compared to the UK, Europe, USA and Asia (Allen et al., 2012).

Unarguably, disputes in the constructive industry will result in a time consuming, unpleasant and expensive experience for all parties involved (Fenn, 2007). Researcher in the United Arab Emirates report that disputes and claims equate to 15% of a building project's value (Zaneldin, 2002). Overall, the underlying causes of construction project disputes are related to the cost, quality, time and safety, which are often the main objectives in any project (Fenn ad Gameson, 1991; Kumaraswamy, 1998).

2.4 Types of Disputes' causes

There has been a tendency in research to examine the causes of conflicts as well as the sources and to seek to place the diverse range into identifiable classification and types even though there is a large degree of commonality in causation (Cakmak and Cakmak, 2013). It is therefore intended to describe the common causes and identify the seven broad categories of disputes based on the nature and mode of occurrence (Cakmak and Cakmak, 2013) **.**It is noted that Fenn (1997) and (2006) has conducted comprehensive studies on previous research based on the cause of disputes in the construction industry, and his results are described in Table (2-1) below.

Table 2-1: *Types of Disputes' causes (Source: Adapted from Fenn,* 1997 *and Fenn,* 2006)

Authors	Types of Disputes' causes
Heath et al (1994)	Contract terms, payment, variation, time nomination, re-nomination and information.
Diekmann *et al* (1994)	People, processes and products.
Rhys Jones (1994)	Management, culture, communications, design, economics, tendering pressures, lay, unrealistic expectations, contracts and workmanship.
Bristow and Vasilopoulous(1995)	Unrealistic expectations, contract documents, communication lack of team spirit and change.
Molenaar*et al(2000)*	People issues, process issues and project issues.
Madden (2005)	Legal, technical and quantum disputes.
Edwin (2005)	Contractual, cultural and legal
Acharya (2006)	Other, owner, contractor, consultant and third party based disputes.
Helen (2007)	Structure, process, people, external and internal disputes.
Cakmak (2013)	Owner related disputes, contractor related disputes, design related disputes, contract related disputes, human behaviour related disputes, project related disputes and external factors
Mitkus (2013)	Other, owner, contractor, consultant and third party based disputes.
Elziny (2015)	Financial issues, Contract Management, Contract documents, Project related issues and Other Reasons.

Acharya and Lee (2006) simplify the number of dispute indicators by designating the causes of conflicts into 5 groups, as per the conflict initiator Fig 2-2.

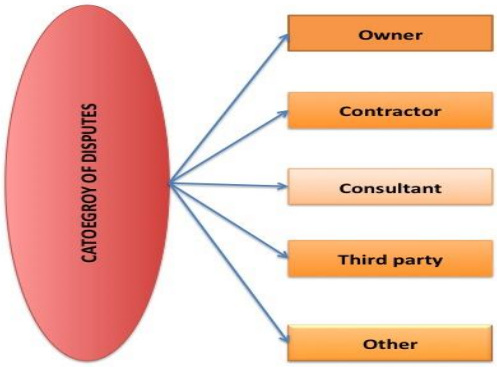


Figure 2-2: Types of Disputes' causes *(Source: Acarya and Lee, 2006).*

The construction industry is one of the most active and buoyant industries in the global sphere, and disputes contain within their nature risks and threats to the availability of technology, resources, expertise et al which potentially damages the development and expansion of the industry as a whole. It is becoming increasingly difficult and complicated for constructors to attend to multiple projects due to the need for adaptation to the numerous unforeseen adjustments with which a construction team must contend (Chan et al., 2004). Much research has been conducted to identify the factors which contribute to construction industry disputes and a number of key studies from various countries have been examined to facilitate understanding of the context in which disagreements arise. Table 2-2 below is adapted from Kumaraswamy (1997) et al, to summarise the findings of the major causes of disputes arising in different jurisdictions (Cakmak, 2013).

Table 2-2: *Summary causes of disputes adopted from Kumaraswamy et al., (1997)*

Authors	Setting	Causes of disputes
Arditi et al (1985)	Turkey	• Trouble in payment recovery from agencies • Inadequacy of material to be used in construction • Problems of contractors • Contracting company's own reputation.
Diekmann and Nelson (1985)	USA	• Project uncertainty • Process problems • People issues • Project uncertainty

Fenn (1991)	Australia	• Designs of contracts • Procedural errors • Variations • Issues relating to scheduled completion.
Hewitt (1991)	UK	• Change of scope • Change conditions • Delay Disruption
Hewitt (1991)	UK	• Acceleration • Termination
Watts and Scrivener (1993)	Australia	• Variations • Negligence • Delays
Semple et al (1994)	Canada	• Acceleration • Restricted access • Weather “cold” • Increase in scope
Conlin et al (1996)	UK	• Payment and budget • Performance, Quality • Administration • Delay and time • Negligence
Kumaraswamy (1997)	Hong Kong	• Inaccurate design information. • Inadequate design information • Slow client response to decision • Poor communication. • Unrealistic time targets
Daoud and Azzam (1999)	Middle East	• Alterations and adjustments • Ambiguity. • Frequent modifications in law

		• Issues related to pitiful documentation
Mitropolous and Howell (2001)	USA	• Doubt attached with the project completion • Inefficiency in the working process
Assaf and Al-Hejji (2005)	Saudi Arabia	• The most common reason for delay is the lowest bid.
Zaneldin, (2006)	UAE	• Changes. • Extra-work.
Fenn, 2007	UK	• Construction and chemical processing contracts compared for impact on disputes
Rosenfeld, 2014	Israel	• Premature tender documents. • Changes in owners' requirements • Definitions and use of the traditional procurement method

Regarding the situation in Hong Kong, for example, Kumaraswamy (1997) determined the reasons and differentiated the root causes from other factors. Common root causes in the construction project sector claims include unfair risk distribution, culture aspects related to the industry, contract gaps and unfeasible aim in relation to budget, time and quality. The remainder are related to proximate causes that involve poor site investigation, incorrect design information, inadequate contract paperwork, inaccuracies in evaluations and modifications introduced by client during the stage of project implementation.

2.5 Methods of Dispute Resolution

According to Murdoch and Hughes (2008), there are three predominant categories of dispute resolution techniques in the construction industry, (i) litigation, (ii) arbitration and (iii) alternative dispute resolution (ADR), a process which allows parties to come to a settlement based on their own negotiations, rather than a formal litigious procedure. These methods include negotiating, mediating and arbitrating. According to Love et al. (2010), the increasing cost of litigation has made quicker and less expensive methods of dispute resolution more attractive to parties. Expense not only include the compensation to be paid on settlement, but other financial losses sustained while conducting a construction dispute (Gebken et al., 2005), which could be very costly for the losing party (Li et al., 2013). Cheung et al. (2000) point out

that in order to improve the effectiveness of project organisations in general, it is vital to reduce such non-value-adding costs.

(Chong et al., *2006)* argues that within a project management framework, negotiation necessitates the choice of a resolution method to accommodate the inevitable issues of confrontation, compromise, smoothing, enforcement, or avoidance. In dispute resolution, account must be taken of the need for an action plan for the resolution of the unsettled disputes, be it mandatory arbitration or litigation or the facilitation of negotiation and mediation (Jannadia et al., 2000). Consideration will be given to the relevant advantages and problems with different methods of resolution and particularly the range of ADR mechanisms to bring about expert determination supported by conciliation, neutral evaluation and adjudication, amongst others.

2.5.1 Litigation

Litigation can be basically described as the system of dispute resolution facilitated by the state judicial system. It is generally a complex and formal process, regulated by a substantial number of rules and procedural requirements that may vary based on the state or county of the judicature (Smith *et al.*, 2009). The parties will find themselves in need of lawyers, solicitors and counsel for assistance in the presentation of their arguments to the courts and the judiciary, for such professionals are generally only those with such rights of audience and expertise in navigating the rules and their compliance. The process and personnel are not renowned for their perceived value for money and time expenditure. The proceedings are open and public, inviting scrutiny and an audience of those members of the public and commercial competition who find interest in the particulars of the dispute (Greenhouse, 2007). The speed of resolution, due to the complexity of the proceedings and rules, is not conducive to the effective continuation and completion of time important construction projects; research by Lyer et al. (2008) in India revealed that, on average, it takes between five and fifteen years to reach an adequate resolution in court. A court trial is a considerably more formal process than ADR, slower process and guided by stringent rules of procedure and evidence (Harms, 2011). This, and the need to instruct professional assistance, is profoundly expensive. Much of the influence of the parties over the management of their own business in dispute resolution is lost to the requirements of the management requirements of the court (Harms, 2011). On the basis of this broadly simple review, commerce demands a more effective method of dealing with problems.

2.5.2 Alternative Dispute Resolution

ADR can be defined as "any method by which conflicts and disputes are resolved privately and other than through litigation in the public courts" (Kovach, 2004). In its various adaptable forms, it is a way of solving disputes without going to trial, and indeed almost 90 per cent of potential court cases are resolved by ADR prior to trial (Harms, 2011). A considered advantage for the parties is that ADR is a method of considering arguments in a significantly less formal manner than a court case, and less intimidating to the parties involved (Harms, 2011). Disputes tend to be determined more quickly and at considerably less expense in money and time, whilst still being assessed by experienced professional adjudicators (Harms, 2011). Where agreed by the parties, the process has potentially the same binding, considered effect as a court verdict, and indeed may be filed at court for enforcement as a final judgement (Harms, 2011). ADR is evidently has advantages in time and cost savings in a more flexible conciliatory atmosphere (Chan et al., 2006).

It is therefore logical that in recent years there has been a growth in national and global ADR bodies and processes in the commercial environment, with a consequent reduction in the need for formal litigation procedures. Gould (1999) asserts that the interest in ADR grew in the 1960s in the US, as a result of a massive increase in slow, expensive, commercial litigation. This 'epidemic' resulted in the development of new methods of resolving business difficulties. The popularity and growth of ADR in the UK may be attributed to the government requirement in 2001 that the court cases of government departments would only go to court as a last option, and instead would opt to resolve disputes with the use of arbitration or mediation (OGC, 2002). There developed a range of mechanisms whereby trained and expert third parties would mediate to assist in the conciliation and mediation processes to enable the parties to reach an agreement which would preserve their commercial relationship (Gould, 1999). Although relatively informal when compared to litigation and court proceedings, Mackie (2005) and Mistelis (2006) explain that ADR is structured, utilises the intervention and assistance of expert third parties, and seeks to eliminate recourse to the courts.

In the context of construction contracts, most parties will only opt for litigation if ADR has first been attempted and failed, largely because of the delays and expense of court proceedings (Yates and Smith, 2007). They are more likely to be focused on the general benefits of the ADR process, such as time and cost reduction, or intangible benefits such as relationship preservation (Cheung, 1999). Gould (1999) remarks that ADR involves a wide range of mechanisms, from

the more formal arbitration process to informal negotiations, including mediation and adjudication. The importance and significance of the variety of mechanisms can perhaps be highlighted by the fact that experts have discussed specific methods as the most effective in solving disputes, from conciliation, negotiation, adjudication, neutral evaluation, mediation, arbitration to expert determination (Kellog, 1999; Cheung et al., 2000).

- **Negotiation**

The cultural background of those involved in a dispute is significant in determining the potential effectiveness of the process of negotiation, whereby parties deal with each other directly or through advisors to resolve relatively minor disagreements (Tinsley et al., 2011). However, should such a direct approach fail to resolve the dispute, the parties will tend to proceed mediation (Chung *et al*., 2009). There are advantages in time and expense savings for the parties to seek to persuade each other of the most effective way of resolving difficulties and preserving the working relationship for the sake of the project and each other's medium term commercial benefit; good communication skills are essential (Goldberg et al., 1999). Negotiation is effective where it takes place to rectify misunderstandings, for example due to wrong preparations or miscalculations, before they escalate (Loosemore, 1999). It is a purely informal process, dependent on the parties, with no official guidelines or formulae for this mode of alternative dispute resolution.

- **Mediation and Conciliation**

The flexible process of mediation and conciliation allows for parties to generate settlements, which can be more innovative and beneficial to the on going project than achievable by the finite nature of the orders available to the courts (Cheung, 2010). Resolution is fostered through the involvement of a trained and expert third party who facilitates clarity of communication between disputing parties, without the same emotional involvement of the parties. The outcome may be considered as voluntarily entered into, and therefore owned by the parties rather than imposed.

The mediator should be independent, unbiased and objective, leading the private and confidential process of mediation, offering ideas to the disputing parties regarding how to overcome the issues and disputes (Kovach, 2004). It is not necessary though for the third party mediator appointed to be a professional person in the construction sector, but should have substantial knowledge about the approaches required in dispute resolution (Rubin et al. 1999).

Mediation is a fairly recent development in the construction field, with many parties striving to have their problems solved by resorting to a third party rather than taking legal action (Mays, 2003). Whilst facilitating communication, the mediator is not required to provide any approach or tactic on how to solve a dispute, simply guidance to the parties in order to be able to decide for themselves and reach a mutually agreeable settlement. Indeed, in the event of litigation having been commenced somewhat prematurely, the judge may recommend parties to appoint a third party mediator at any time before or during the court proceedings (Rubin et al., 1991).

- **Early Neutral Evaluation (ENE)**

This method serves to assist in the early resolution of disputes via a confidential, voluntary, non-binding and shared process between the parties, often with the instruction of an expert third person, often an attorney, to advise on the weight of arguments. This impartial assessment by a well-informed external authority may at times shift parties away from impractical situations which jeopardise the ongoing nature of the project, or at least describe a more detailed account of the strengths and shortcomings of their cases (Lehman, 2015).

- **Dispute Adjudication Board (DAB)**

The DAB is an independent panel of three experts within construction, with considerable qualifications and experience in different aspects of industry and in the operation of relationships and progress of project planning and implementation. This enables them to practically assess problems and command respect of the parties for their suggested solutions and settlements for disputes as they arise in the course of the project (Harmon, 2009). The DAB was established by the international construction industry as a response to the reported ineffectiveness of current arbitration practices in providing both an adequate and cost-effective way of resolving disputes (Seifert, 2005). It would be set up at the beginning of the project for their expertise to be called upon as major projects progressed. Each contracting party would appoint one board member each, then jointly decide on a third; if they failed to agree, the other two board members would appoint the remaining panel member. The roles assigned to the board would include the carrying out periodical visits to the site, as well as receiving project updates to gain maintain their awareness and knowledge about the project and the parties. Regular meetings would be held to deliberate on any arising issues or disputes, to listen to the concerns voiced by the parties and give recommendations (Gould, 2004).

- **Expert determination**

An expert determination method to settle disputes is frequently included in the contractual dispute resolution clauses. It will generally seek to offer a '*final and binding'* determination by an independent and experienced professional with skills and expertise in the field of the particular disputed issue, for example employee matters or specific construction materials. The parties must deliberate on the appropriate procedure for the appointment of the expert to deal with their contractual arguments, and identify the most suitable course of action to facilitate such assistance in the settlement process. According to Vozzo (2012), though, it is not clear whether parties are sufficiently adept at identifying the types of role the selected expert determination tool should be accomplishing.

- **Adjudication.**

Adjudication aim to hasten the settlement process of disputes on a temporary or short-term basis to facilitate the continued operation of the project whilst awaiting final determination of the dispute either through arbitration or litigation (Harmon, 2003). It can be relatively more expensive than other forms of ADR due to the fact that is a part of the legal and litigation processes, but it does allow progress to be made to resolve relationship difficulties between the parties (Gould, 2003; Richbell, 2008). It enables an impartial third party, the adjudicator or adjudication panel, to order temporary solutions to construction arguments referred, based on contractual terms contained in the primary agreement or statutory stipulations; a decision should e reached within 28 days (Fenn, 2010). The project contract may indeed require that the decision of the adjudicator is binding upon parties, and as such the process is considered to be an effective method of ADR resolution (Sweet and Schneier, 2009). In the UK construction industry, adjudication has generated a number of substantial benefits which ensure disputes are speedily and economically resolved with the minimum disruption to the project's progress, and it is common for parties to insist on the inclusion of a clause supporting the binding nature of the finding (Richbell, 2008).

- **Arbitration**

The arbitration clause in a contract seeks to promote a private, confidential method to resolve difficulties either where they are anticipated by events, or after they arise, working as a communications channel to facilitate cooperation between the parties. The incorporation of a contractual clause will often require decisions to be binding, thus avoiding the expense of escalation (Harmon, 2003). It is nevertheless a more formal structure of ADR than mediation

(Fenn, 2010). ADR, in its various forms, has become an increasingly popular process of dispute resolution, given the increasing expense and time of court litigation, giving the parties greater control over outcomes. It is fostered, so far as the construction industry is concerned, by government initiatives such as the Housing Grants, Construction and Regeneration Act (1996) and recommendations of the Office of Government Commerce (2002) in public procurement best practice. There are two major approaches to dealing with construction disputes in the British legal system; (i) litigation in the court system and (ii) arbitration before an impartial individual or board, selected by the parties involved to study the case and suggest action plans. An increasing number of cases in relation to construction are now primarily referred to arbitration, and indeed the arbitrators have become more aware and knowledgeable about how the construction industry works, thus developing a specific expertise to match the interest of justice (Sobel, 1996).

2.6 Critical Success Factors for Alternative Dispute Resolution

Critical success factors for the increased use of ADR methods parties include speed, reduced project disruption, financial and manpower savings, flexibility of procedure and increased communication between parties with greater confidence in maintaining relationships (Harmon, 2001; Harmon, 2002). In ADR, there are seven covert factors, and five overt factors that are associated with mediation and negotiation. These include voluntary basis, flexibility, fair treatment and proceeding speed (Chong and Zin, 2012). Studies in Nigeria found that of the different ADR procedures negotiation, perhaps the simplest of the processes, has the highest degree of success, generating considerable savings in cost and time, and improvement in working relationships (Isa, Rasheed and Emuze, 2015). Lu, Zhang and Pan (2015) also found that reputation, cooperation and trust, time, judgement execution and emotion are the five main critical success factors of ADR; Cheung (1999) established low cost, relationship preservation and speedy resolution were also beneficial outcomes. In a follow up study in 2004, Cheung found little had changed in the perceived value of ADR; the preservation of the business relationship, neutrality, fairness, enforceability, cost and speed (Cheung *et al*., 2004).

Impartiality and consent have both been cited as critical success factors to ADR procedures (David, 1988). Further studies suggest that a degree of informality, third-party involvement, the nature of proceedings and confidentiality form the basis of the factors of critical success (Goldberg *et al*., 1992). York's (1996) study suggested the importance of cost, time, relationship preservation, binding decisions, procedural flexibilities, confidentiality and control are critical success factors of ADR. Table 2-3 summarizes the critical success factors findings,

including those of Brown and Marriot (1999), Cheung (1999) and Hibberd and Newman (1999) see Table 2-3 below.

Table 2.3 illustrates that there are many critical success factors involved in alternative disputes resolution. Based on the data in the table, all researchers stated that the trust factor was the most critical success factor in alternative dispute resolution, while many also acknowledged the importance of factors such as speed, flexibility, control on all parties and preserving relations in being effective towards influencing alternative disputes resolution. Ultimately, researchers highlighted that the cultural differences factor had the least bearing or impact as a factor on alternative disputes solution. David, 1988 and Suen 2001.

Table 2-3: Summary of critical success Factors for ADR (Source: Adapted from Cheung and Suen, 2002).

CSF \ Authors	David (1988)	Goldberg et al (1992)	York (1996)	Cheung (1999)	Hibberd and Newman (1999)	Brown and Marriott (1999)	Suen (2001)	Blake *et al(*2014)
Speedy			✓	✓	✓	✓	✓	✓
Cost			✓	✓	✓	✓	✓	✓
Flexibility		✓	✓	✓	✓	✓	✓	✓
Confidentiality	✓	✓	✓	✓	✓	✓	✓	✓
Parties ability to control	✓		✓	✓	✓	✓	✓	✓
Third party control on the process		✓	✓		✓		✓	✓
Preservation of business relationships	✓		✓	✓	✓	✓	✓	✓
Degree of cultural difference	✓						✓	
Addressing power imbalance	✓				✓	✓	✓	✓
Remedies				✓	✓	✓	✓	
Enforceability	✓	✓	✓	✓				
Degree of formality			✓		✓		✓	✓
Relationships between parties	✓						✓	✓
Type of contract		✓		✓		✓		
Local law system				✓		✓	✓	✓

2.7 Barriers to Alternative Dispute Resolution

Given the findings of the benefits to the construction industry of ADR there are still pockets of resistance to its use. Research into construction mediation in the UK list a number of barriers which can be grouped into six categories; (i) lack of social awareness, (ii) a business culture of dispute litigation, (iii) insufficient planning and preparation, concerning the awareness of ADR strategies, (iv) process barriers, (v) lack of security and trust, and (vi) the availability of adjudication processes (Abdullah, 2015). In Kuwait, the lack of mediation awareness and cultural concerns regarding its use further posed further barriers to ADR, and as such, were found to be the predominant barriers to employment mediation for construction disputes (Gharib *et al*., 2011).

2.8 Summary

This chapter explored the literature on the subject of the resolution of construction disputes, defining the concepts of conflict, claims, disputes and dispute avoidance and their differentiation in order to understand the research undertaken on perceived effectiveness of disputes resolution, There is occasionally an evident lack of distinction, and the terms are often used interchangeably. Disputes clearly have a significant financial impact on construction projects, in terms of money, time, and the potential loss of an effective working relationship between the parties.

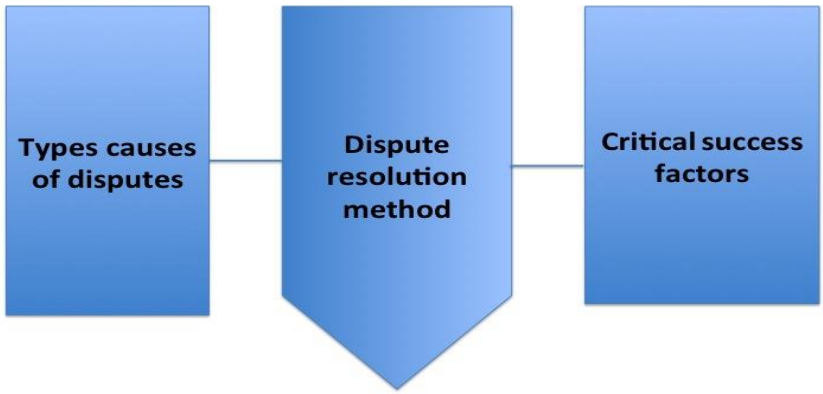


Figure 2-3: Initial conceptual framework

They are however inevitable, and as noted in Section 3, arise from numerous causes and for various reasons, often avoidable, but nevertheless costly. It has proved vital to identify the nature and categorisation of the conflicts in order to seek the appropriate method of either avoidance or settlement. Accordingly, in the consideration of resolution methods in Section 4 it is clear that the avoidance of litigation is essential in terms of time and cost, thus avoiding putting the whole project per se into jeopardy. The alternative dispute resolution, from negotiation to mediation, arbitration and expert determination, all stress the need for improved communication between parties. The critical success factors of ADR focus on speed, economic issues, resilience, reputability and trust; there is a need to consider further how cultural and awareness factor can be overcome in order to facilitate the process of contractual relationship improvements. The most important thing in this and the next chapter is that the researcher develops an initial conceptual framework, which is proposed in this research. This proposed dispute resolution framework to improve the efficiency of methods of dispute resolution in Saudi construction projects will be explained further in the following chapters see figure 2-3.

Figure 2.3 describes the initial conceptual framework. The most important issue in improving dispute resolution efficiency in the previous studies was to determine and understand the types and causes of disputes. In the previous research, there were differences in the range of disputes and their causes, in terms of number and nature, and also in terms of the culture of the different countries. Through understanding the various causes of disputes, this can help to ease the recognition of, and the actual dispute resolution method itself. and then the critical success factors for alternative dispute resolution were set up, with previous studies showing that these dispute resolution methods were selected based on critical success factors.

Chapter 3. Overview of Disputes in the Context of Saudi Construction Industry

3.1 Introduction

In this chapter, an overview of the Saudi construction project including the Middle East countries and construction, the background of Saudi, the Saudi of economy, the Saudi construction project, the procurements in Saudi, the contracts in Saudi, the conflicts, claims and disputes in Saudi, the method of dispute resolution in Saudi and finally the Saudi council of engineers.

3.2 Middle Eastern countries and construction project dispute resolution

There has been a continuous rise in the number of disputes in the Kingdom of Saudi Arabia (KSA) region of the Middle East (Allen et al., 2012). The total value of disputes in the Middle East region was at its peak in 2011 (US$ 112.5 million), which has steadily reduced to around US$ 76.7 million in 2014. However, the time period for resolution has been on the rise, which can be observed by analysing the table below (Allen et al., 2015). With regards to disputes' resources in construction contracts in the Middle East, Daoud and Azzam (1999) mentioned that "the influence of local culture on the performance of the contract parties". Table 3-1

Table 3-1: Middle East Construction Disputes Resolution Data 2015

	Disputes value (US$ millions)					Length of disputes (months)				
Middle East	2010	2011	2012	2013	2014	2010	2011	2012	2013	2014
	56.3	112.5	65	40.9	76.7	8	9	14	13	15

In terms of recognized establishments, a number of global arbitration organizations in Europe have conventionally been used as settings for International Commercial Arbitration (ICA), including several developing countries and foreign bodies. When the context of these organizations is referred, some common names are marked such as the London Court of International Arbitration (LCIA) and the International Court of Arbitration. Several arbitral institutions have been introduced recently in different countries including Nigeria, China, Singapore, Dubai and Cairo. The influence and instrumentality of the Asian-African Legal Consultative Organization (AALCO) should also be pointed out in terms of its endeavours to make arbitration centres more regional (Asouzu, 2006). According to Asouzu (2001),

AALCO's endeavours contributed to the establishment of regional centres in African countries such as Nigeria and Egypt, with the main aim focused on introducing ICA into Asian and African countries.

There has been a considerable rise in the number of delayed disputes throughout Asia, the Middle East and the UK, with disputes in the Middle East taking longest to be dealt with: such cases can last up to 15 months on average, followed by disputes in Asian countries at just over 14 months. On the other hand, disputes in the USA and Europe have seen a reversing trend with cases taking less time to resolve in 2012. For example, disputes in the USA took slightly less than a year (11.9 months) to deal with. As for dispute charges, they declined in all countries except in the UK, where they kept rising (Allen et al., 2013).

A closer look at one of the most significant value disputes dealt with reveals a total sum of £660 millions, which accounts for one of the major mega-construction cases being fought. As for the UK, the average stood at £17.89 millions, with almost 13 months to decide disputes. At the top of the table, the Middle East still dominates with rates reaching more than £40 millions with approximately 15 months to arrive at a final decision. Still in the Middle East, there was a decline in the costs from a high of almost £75 millions in 2011 to £43 millions in 2012, which is a dramatic fall; however, values continue to rise to such a level that the Middle East is currently the highest in terms of value disputes based on the area. According to the same report, there is no specific cause for such decline, but this still shows the sheer size and scale of construction projects launched in the Middle Eastern region (Allen et al., 2012).

One of the factors contributing to this length of resolution is the sheer size of disputes in the Middle East. The backlog can also be ascribed to the limited number of arbitrators and experts in the field. In Asia, the resolution process is slightly faster at almost 15 months and a typical value of around £27 millions. A major cause for the decline in value is shown in the adoption of cooperative contracting and associated procurement tactics in these countries (Allen et al., 2013).

3.3 The background of the Kingdom of Saudi Arabia (KSA)

The members of the Gulf Cooperation Council (GCC) include the KSA, the United Arab Emirates (UAE), Bahrain, Kuwait, Oman and Qatar. Located in the Middle East, Saudi Arabia has Iraq, Jordan and Kuwait bordering it from the north; Bahrain, Qatar, UAE and the Arabian Gulf bordering it from the east; and Oman and Yemen bordering it from the south, and finally, the Red Sea bordering it from the west. Figure 3-1.

In general, the GCC bases its culture firmly on the religion of Islam, and this is particularly true in the case of Saudi Arabia. Contrary to a wide number of societies in the world, the culture of the religion is centred on the beliefs of the religion. In Saudi Arabia, religion is considered to be a highly influential and guiding factor that impacts upon all aspects of life, and Sharia Law equates to the Kingdom's constitution (Saudi Arabia's Constitution, 2016). Cultural awareness in Saudi Arabia is also heavily influenced by social structure and tribal traditions.

The KSA is the second largest country of the Arab world and the largest country within the Arabian Peninsula; the population is 28 million people, and the area in kilometres squared is 2,150,000. According to OPEC (2013), Saudi Arabia possesses 18% of the world's petroleum reserves and is the largest exporter of petroleum. It is this statistic that makes the country the fastest-growing economy of the Middle East. It can further be stated that Saudi Arabia possesses the Middle East's largest construction sector (GCC, 2013).

Figure 3-1: Map of the KSA

3.4 The Saudi economy

The KSA possesses the largest construction sector in the Middle East region. The government is even making attempts to increase the investment made by the private sector in the construction industry. The changes in the demand and supply of oil greatly influence the industry. The GDP of the country was increased by 3.3% in 2012 while the rate was 6.8% in 2011 (Hasan, 2012). In 2011, the minimal growth of GDP was 28.8% while it increased by 6.8%. As per the analysis done by the International Monetary Fund (IMF), the KSA is likely to achieve slower economic growth.

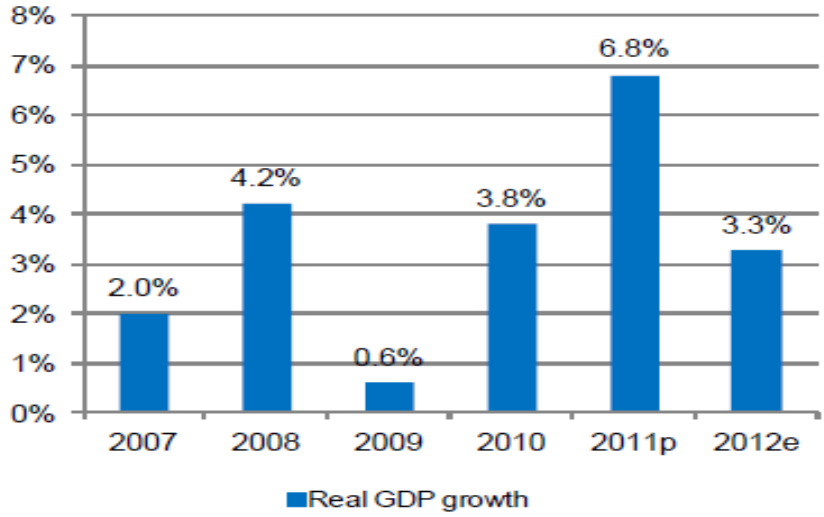


Figure 3-2: GDP Growth in Saudi Arabia

Fewer fluctuations in oil prices can result in higher GDP growth as compared to the preceding periods. An increased oil export made by the mining and quarry sector was responsible for the growth of GDP by 29% in 2011. The growth further increased by 41% due to the development in the mining and quarry sector. The increase in production and above-average prices were responsible for 70% of the growth in GDP. Another sector responsible for 10% increase in the GDP was the manufacturing sector, which holds an even greater potential. A growth rate of 28% YoY (year-on-year) has been marked in this sector. The government sector made the next highest contribution. This sector accounted for 8% of the increment in the GDP while the sector itself recorded a growth of 15% (Hasan, 2012).

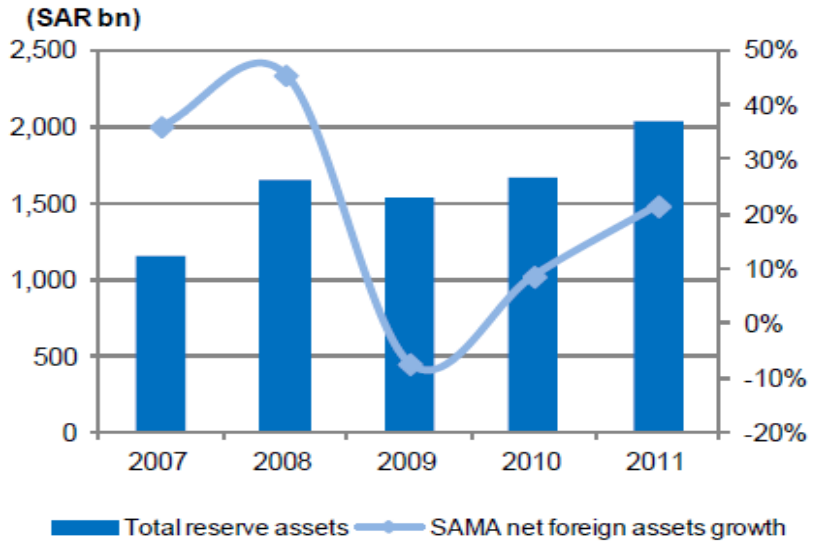


Figure 3-3: Saudi Arabian Assets

From 2010 to 2014, the government of the KSA invested around US$ 385 billion in the economic and social infrastructure of the economy. An estimated US$ 16.5 billion was invested in the renovation of the transportation system in the sacred city of Mecca. This included a heavy expenditure of around US$ 9.4 billion for the renewal and reconstruction of the rail line between the two cities of Mecca and Medina. A total of US$ 66 billion is in the pipeline for the construction of 500,000 new units in the housing sector. Energy and resources accounted for around 47% of the total cost of the construction programme. The cabinet of the KSA approved a state budget for the new economic year of 860 billion Saudi riyals, the equivalent of $ 229.3 billion. This is acknowledged as the largest state budget in the country's history (Central Department of Statistics and Information Saudi Arabia, 2015). The government of the KSA has introduced a number of measures for the reconstruction of the whole city. It has even diversified in the sector of solar energy by investing around 10%. The government is trying to accomplish its energy requirements by 2020 through an investment in the solar energy sector. It would also generate greater employment opportunities, and thus create 15,000 jobs. At present, there is a large potential in Saudi Arabia to increase the amount of localized jobs available to Saudi nationals. This is as a result of a predicted growth in tourism in the country, as well as the oil-based industries (SAMA, 2013). Solar energy plants have been built in the Eastern region of the country at Jubail and in Medina at Yanbu port at an investment of around US$D 800 billion. Around 20% of the total spending in the construction sector has been directed towards the reconstruction of the transportation sector. The King Abdul-Aziz International Airport reflects the great development taking place in the aviation sector of the KSA. One of the largest projects in the aviation sector with a cost of around US$ 7.2 billion has been initiated. It has enhanced

the overall annual capacity of airports from 17 million to 30 million passengers. Another sector that has drawn the attention of the KSA government is that of railway networks in the economy. It has added a total of 39,000 km long railway tracks and invested in three railway projects, thus improving the railway services across the economy (GCC, 2013).

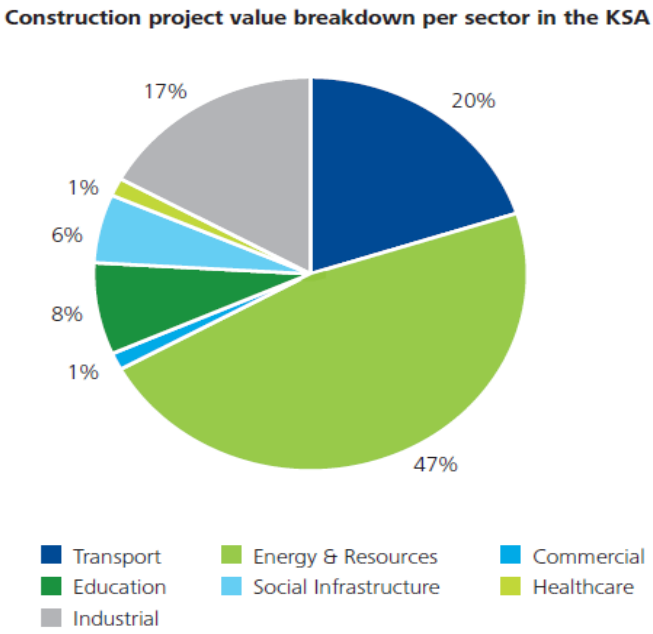


Figure 3-4: Contract Project Value Breakdown by Sector in the KSA

3.5 Saudi construction projects

The Construction Project of Saudi has expanded operations in the Middle East and is known to be one of the largest industries in the entire region as it has been ranked second (*Hide* et al., 2003). Given the complex nature of the construction industry, which is composed of numerous parties such as owners, contractors, regulators and consultants, this is particularly important (Enshassi, Mohamed, & Abushaban, 2009). The construction industry in Saudi Arabia is divided into two sectors, private and public. Both sectors have low performance being the largest construction industry; it suffers from some vital challenges and efficiency in the performance (Falqi, 2004). Several local studies have been conducted, which support the view that the construction industry in Saudi Arabia is suffering from poor performance. The construction industry has been considered as contradictory in Saudi Arabia (Al-Kilani, 2011).

Numerous means are used in other industries to resolve disputes, such as mediation and dispute review boards. This fact has also been supported by the orders of courts and previous experiences. Despite all its problems and obstacles, the construction industry in Saudi Arabia

has been able to develop and enhance its size by embracing innovative ways in its style of working.

The research work is found to be insufficient in the Saudi construction industry, which adds more to the problems. The areas in the construction industry which need attention in research work are contracts and associated claims. On comparing the Saudi construction industry with the construction industry of the UK, it was found that the scope of improvement in the available knowledge and their sources exists in the construction industry of the UK too and the overall situation was found to be similar to Saudi Arabia (Conlin et al., 1996). Further, it was explored that the procedures being followed for the procurement of projects are leading to disputes in the projects.

3.6 Procurement systems in Saudi Arabia

The government procurement regulations in the KSA have been designed to include various royal decrees in the framework. For government contracts, it was mentioned in the decree issued in 1983 that the contractors are required to subcontract to the extent of 30% of the original contract. Further, the decree provided to support the business concerns particularly, which are governed by the Saudi nationals (Cooper et al., 2010).

In this regard, Saudi nationals are not required to do anything; the exemption is the only thing, which is essentially required. There is a 10% price preference being given to Gulf Cooperation Council "GCC" products in various government projects. As per the procurement regulations, priority is to be given to domestic products in Saudi Arabia. However, the general procurement decrees do not apply to defense products, and for these products, the regulations vary on a case-to-case basis. The government procurements, in which foreign suppliers are involved, require special training sessions for the national (Domnar, 2009).

In addition to this, the government of Saudi Arabia can, at its own discretion, give preference to the joint venture companies, particularly when the consumption of Saudi commodities is involved. Since the military projects are ample in size, and requirements differ from one project to another, a properly designed approach is needed for these projects (Elbadawi et al., 2010).

The services of foreign companies can be used by the Saudi government for the sale of its products and services, or it can even directly contact the various public entities registered on a temporary basis. Though the foreign companies dealing with the government do not need to get registered in Saudi Arabia, they have to get temporary registration from the Ministry of

Commerce within a month (Abbas et al., 1998). The efforts of the Saudi Council of Ministers in 2003 have made the government procurement process more transparent. It requires the disclosure of the names of the parties, their financial status, their contract period and site of execution, and contact (Hisrich, 2009). The Saudi Arabian government was able to initiate a number of negotiations for the procurement after attaining membership of the World Trade Organization (WTO). It was even viewed as one of the keen observers in the WTO Committee on the government procurement in December 2007 (Ive et al., 2000). In the committee's accession process, there is no other initiation for negotiations proclaiming that it will initiate at the time of the revision of the agreement (Moore et al., 2003). In December 2011, the GPA text in the agreement was proposed for revision. At the beginning of 2012, it was assumed that negotiations in the GPA accession would be started in the region of the KSA (Shaikh et al., 2010). In the present day, the 'law-price tendering process' is gaining increasing popularity, and many studies report this method as being responsible for the existence of adversarial relationships between different project parties (*McGeorge et al.*, 2007).

The contract is considered to be an essential document in the process of assessment of claims as the parties to the contract abide by the terms of the contract. In making a contract, several strategies are needed to be drawn by the owner, as depicted in Figure 3-5 (Agwu, 2012). There are some key reason and moderation of the project, which are defined as project delivery, construction scheme designing and having the right form of contract. The varying forms of contract, resulting from different circumstances, have changed the procedures being followed in conflict resolution in construction projects.

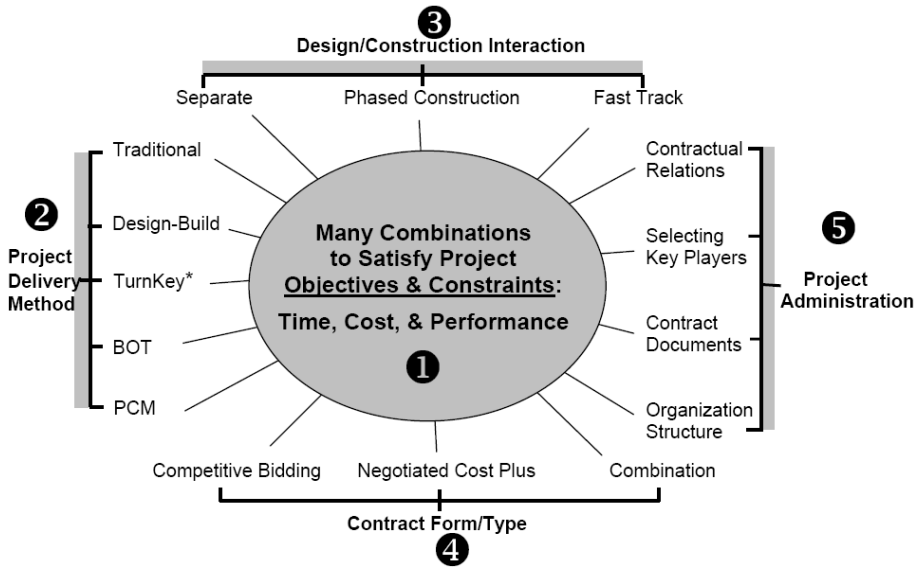


Figure 3-5: Strategies Used for the Purpose of Contract (Agwu, 2012)

3.7 Contracts in Saudi Arabia

Since this research has been carried on construction projects in Saudi Arabia's private and public sectors, it can be noticed that due to state support, the public sector holds the most control, because the public sector has spent nearly 4 billion Riyals on projects such as constructing universities, airports, railways and hospitals and also expanding the two holy shrines in Mecca. It should be considered that over 300000 Saudis are working in construction sector (Abbas, 2016).

Meanwhile, private sector cooperation in domestic gross production is anticipated to rise from 40% to 65%, as the cooperation in construction section in Saudi reached 7% in year 2015. Among the projects that were recently executed by private companies Saudi Binladin Group were: the expansion of the Prophet's Mosque in Madinah Munawwarah (the Holy City of Madina) and King Abdullah University in Thuwal, which cost over 5 billion dollars, while Saudi Oger Company, the Saudi company reported that its net income exceeded 8 billion dollars, conducted the execution and supervision of the construction of the railway station and Prince Nora University in Riyadh (ALqasabi, 2016).

There are some standard forms of contracts, for instance the Institution of Civil Engineers and the International Federation of Consulting Engineers (FIDIC), which are being followed in Saudi Arabia in order to determine the relationship between the parties involved in a contract. This is done for the purpose of carrying out a particular project (Abbas et al., 1998). Foreign firms have a dominant position in the construction industry of Arab countries.

As far as the process for domestic contracts is concerned, a single contract model is applied for conducting governmental projects. In this contract model, usually, a public works contract (PWC) is entered. Further, these contracts appear to be one-sided contracts, due to which contractors should assume more risk. For this reason, these contracts become less preferable for local contractors. Local contractors are demanding modifications in this process so that these contracts can be made less risky (Tumi et al., 2009).

In recent years, the formats of international contracts have undergone numerous changes in the local market of Saudi Arabia. Commonly, the formats of international contracts are known as FIDIC or, sometimes, as AIA. The legal system of Saudi Arabia follows the law of Shari'ah, along with the other common laws for business contracts, which provide for the regulation of international contracts (Tumi et al., 2009).

A research study revealed the impact of different forms of construction contracts on construction claims (Shaikh et al. 2010). In this research study, a survey was conducted with the contractors, owners and consultants by applying the random sampling strategy. This research study concluded that the Saudi public used a contract model whereas 7% of contractors used the FIDIC; others used various different forms, which they found to be suitable.

A thorough study of work contracts was done by Hisrich in 2009, in order to understand every aspect of the contracts. This research was carried out by conducting a survey with the engineers and companies operating in the construction industry. From the analysis of the data, it was inferred that public works contracts in Saudi Arabia are not as transparent as they should be. On the other hand, they have numerous vital obstacles with regard to the degree of fairness (Hisrich, 2009). As a consequence, the reliability of contracts is being questioned in Saudi Arabia.

Another study was conducted with a view to gaining insight into the deficiencies in public works contracts in Saudi Arabia. The major problem areas encountered in this research were the terms, conditions and articles contained in the contracts. In public works contracts, the contractors were compensated for the inflationary effects in the contracts. The aforementioned weakness or deficiencies were highlighted in this research study by making a comparison with the other standard forms of contracts (Cooper et al., 2010).

There were a few claims, which were raised in the FIDIC contract, that were having an impact on capital and time. These cases are usually found in the public works contracts. Further, it has been discovered that the practice of delay in payments is persistent in each form of contract (Abbas et al., 1998).

3.8 Conflicts, claims and disputes in Saudi Arabia

Saudi construction projects have been subject to a lot of conflicts, claims and disputes largely due to the dramatic growth and development of urban space in the private and public sectors in Saudi Arabia, such as the establishment of infrastructure including airports, bridges, universities and railways. These large projects require highly skilled employees and technicians of different nationalities. Because all these parties work in the same place and at the same time, lots of disputes result, and they are not easily resolved, so the only method used is litigation.

For example, delay in completion of projects is becoming a major concern, and this can be observed from the facts revealed by a survey that 70% of the projects could not be completed

on scheduled time (Al-Sultan, 1987). In other studies, it was found that a contractor can be influenced by a number of things, including the project period extending, the overhead costs of the project increasing and a hindrance to be presented that stops the contractor from identifying an alternate business opportunity (Al-Kharashi, 2009). Finally, all these disputes arising from large Saudi construction projects need an untraditional method of dispute resolution to solve them.

3.9 Methods of dispute resolution in the KSA

In the case of Saudi Arabia, disputes in the construction industry have been ongoing over the past few months; nevertheless, it is still largely a transactional market in which disputes that do happen are generally dealt with through global arbitration bodies and local litigation. With respect to local litigation, existing government business laws stipulate that disputes related to key government ventures be resolved by these courts. It should be pointed out that the government is the largest procurer of construction projects in Saudi Arabia. With that in mind, and in reference to the 2012 Saudi Arbitration Law, the process is gaining momentum, with local courts continuously delivering vital verdicts in favour of the intent of the legislation, while contracts are increasingly referring to it in their dispute resolution terms. It is therefore predicted that Saudi arbitration will become the prevailing type of dispute resolution in Saudi construction ventures for years to come (Cowling, 2014). Al-Reshed (2002) looked at dispute resolution in Saudi Arabia, investigating cases that were presented to grievance courts to determine the time it took to resolve such cases. It was found that dispute cases in the country lasted from one year to as long as eight years.

3.9.1 The litigation system in Saudi Arabia

The litigation system in the KSA has been framed in such manner that criminal and civil cases have been made subject matter to be dealt by the Ministry of Justice. Jannadi et al. (1998) discovered that the Board of Grievances is the authority vested with the responsibility for resolving disputes related to public contracts. The structure of the legal system in the KSA constitutes the Board of Grievances, Shari'ah Courts and several other committees divided into various categories based on the nature of cases involved. The courts of Shari'ah have been vested with all the powers relating to general matters and are empowered to hear cases involving civil matters, whereas different adjudicatory bodies, having special powers, exist in the country to hear and resolve special matters.

Apart from having the powers to handle civil cases, the Courts of Shari'ah have also been empowered to adjudicate matters pertaining to family and property. Further, various independent specialized committees, free from the jurisdiction of the Shari'ah Courts and Board of Grievances, have been formed under the auspices of the government agencies to deal with special cases (Ismail et al., 2012).

The desperate need for reforms in the judicial system of Saudi Arabia forced the king of the country to bring in new laws in the system, and consequently a new law, named Judiciary-4, has been added to the series of judiciary laws. The introduction of the new law will lead to the establishment of some new courts in the country (Hallowell, 2012). The newly established courts, which include the labour courts, criminal courts and commercial courts, will be responsible for adjudicating special matters in the country. The Board of Grievances will be given the authority of Apex Court as soon as these courts are made operative. However, it is to be noted that the new law, which was introduced in 2007, still has not been made operative in its entirety.

The Board of Grievances covers within its ambit cases relating to the rights provided for in the civil services. Further, it extends to the law matters pertaining to the pension of the employees, whether they are government employees or hired or even independent public entities. The administration has not been able to utilize its powers correctly and has violated rules and regulations. In addition to this, the absence of a proper legal system has led people to raise their eyebrows regarding the working of the administration. This recklessness in the administration has resulted in cases for compensation being filed against the public corporate organization and the government. However, in most of the cases, either the government or the corporate agencies are involved as a party (Dvir, 2005). There were a few instances where the Bureau of Control and Investigation has also been noticed to file cases of disciplinary conduct. Penal cases for various crimes, such as forgery, combating bribery and others, are filed with the Board of Grievances. The Board of Grievances has also conducted hearings for the criminal activities that are provided for under Royal Decree no. 77 dated 23/10/1995 and Royal Decree no. 43 dated 29/10/1975 relating to the Law of Handling Public Funds.

Finally, although Saudi construction projects use litigation to solve disputes in the public sector, there are still many barriers to such use, such as the small number of judges and courts (Ansary, 2015). In addition to these barriers, there is also judges' lack of knowledge of how to deal with alternative dispute resolutions in Saudi construction projects.

3.9.2 Expert determination

There are differences in expert determination in Saudi Arabia to those in other countries which content, which is called ADR. Expert determination in Saudi Arabia is under cover of litigation and is conducted at the judge's request. The judge also is not constrained to execute upon the report. The Saudi Council of Engineers' Arbitration Center, other than the responsibility that it holds, such as arbitrating in disputes, also provides expert determination through trusted experts from the Saudi Council of Engineers.

When a dispute is brought before a judge in court, the judge will have the right to consult on the issue under the following conditions. The judge can request for a trusted expert or other state entities to be consulted, and then they will provide expert determination. If such an expert is not at hand, the judge will have the right to request an expertise report to be provided by whoever is available and able to be reached. There is a department in the court that consists of experts and engineers, and its responsibility is to assign expertise to the court. Also, they are a commission for expertise within the Ministry of Justice that holds meetings three times a year (Al-Fouzan, 2016).

3.10 The Saudi Council of Engineers (SCE)

The Saudi Council of Engineers has the Arbitration Centre to resolve disputes to do with Saudi construction projects in the private sector. The Arbitration Centre of the Saudi Council of Engineers has more than 55 arbitrators and experts, who are chosen based on a special evaluation by the Arbitration Centre of the Saudi Council of Engineers as well as their experience and qualifications. According to these conditions, the Arbitration Centre of the Saudi Council of Engineers licenses them to engage in arbitration in Saudi construction projects.

One of the duties of the Saudi Council of Engineers is to establish an appropriate foundation to persuade engineering career and promote employers' expertise, based on the Council of Ministries' resolution, number 222, where a mandate is issued on 13.9.1423 AH. Upon that it is mandated that assessments, investigations, courses and conferences are to be conducted to promote such career and also that technical consolation must be executed according to the Council Secretariat's ground rules (SCE, 2015). The Saudi Council of Engineers covers specific aims, points of view and strategies. Also, one of its aims is to build up highlighted competence and promote an atmosphere for engineers in order to create development, innovation and,

ultimately, to support the Saudi Council of Engineers. Under this resolution, some items are also added (SCE, 2015).

3.11 Summary

This chapter's contents form nine sections. The first section explains the Middle East countries and construction especially the KSA is part of it. The second section that the background of Saudi. The third and fourth section, that the economy of Saudi and Saudi construction project where the Saudi construction project is the pivot of the economy of KSA, as the overall economy is dependent on the construction industry. The fifth section the procurements in Saudi after that the six section, the contracts in Saudi where the public work contracts it used in public sector and the have many problems such as: bias and high risk, the missing set of rules to make provisions for high inflation. The seventh section covers conflict, claims and disputes. Then the eighth section is about methods of dispute resolution in Saudi Arabia. Such resolution depends on local courts in both the public and the private sectors, although litigation in Saudi Arabia has disadvantages, such as economic costs (including both direct and indirect costs), and costs involving time, relations between parties and also reputation. The final section is on the Saudi Council of Engineers.

Chapter 4. Methodology

4.1 Introduction

This chapter discusses the methodology that was used in this research, and how data has been collected and questions answered. Literature reviews have shown that there are various methods and means by which to achieve the objectives and aim of the research. The research onion model (Figure 4.1) has been adopted, which has been noted by Saunders et al. (2012). There are various layers, each of which refers to an aspect of the research process, which aids the researcher in organizing, defining and developing the research in a better way. The first layer represents the research philosophy, the second the research approach, the third the strategy, the fourth the choices, the fifth the time horizon and the sixth the methods of data collection and analysis.

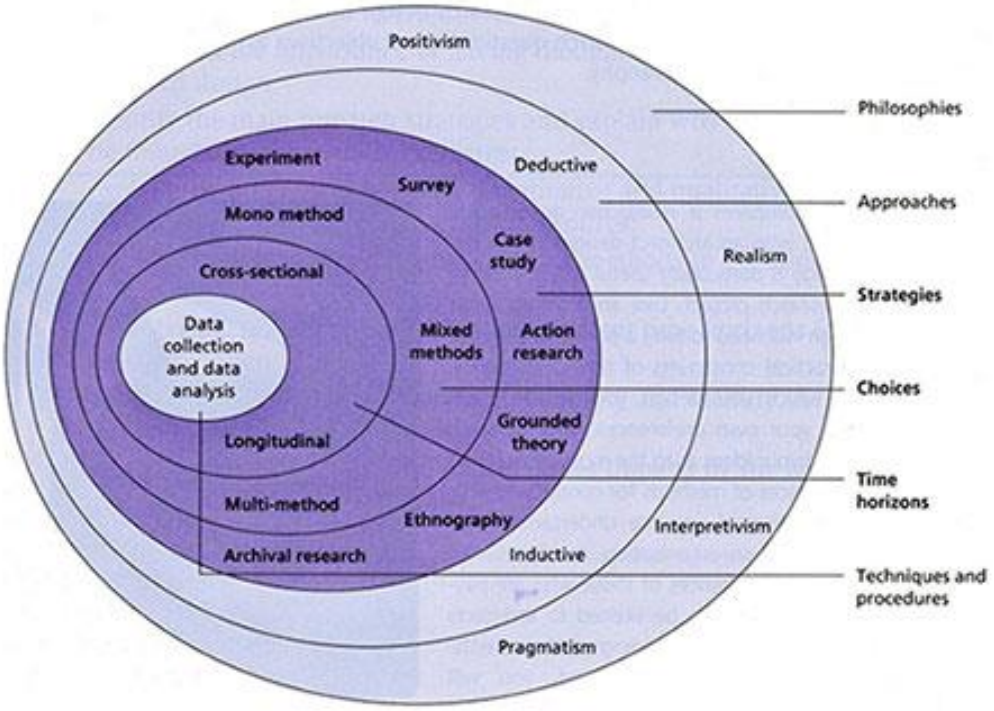


Figure 4-1: The Research Onion Model (Saunders et al., 2012)

4.2 Philosophy

The researcher has to adopt a philosophy, which, to some extent, depends upon practical considerations, but mainly it is the linkage between knowledge and the process by which it is developed (Saunders et al., 2012). Bryman and Bell (2007) are of the opinion that the main epistemological and ontological methods used by the researcher are of great importance as they effect the selection of the various research methodologies and also on the explanation of the studies that were conclude thereby. The philosophy of research consists of three assumptions: epistemology, ontology and axiology (Sexton, 2003).

4.2.1 Ontology

Ontological assumptions include two aspects: objectivism and idealism (subjectivism). The distinction between them is that objectivism is based on the assumption that the external world does not have a predetermined nature or structure. Defined subjectivism as an unknowable reality, which can be noticed by individuals in numerous ways; accordingly, subjectivism might be considered to be the most suitable ontological philosophy for this research (Saunders et al., 2012).

Ontology idealism /subjectivism is considered to be the most relevant to this research due to the small number of experts and arbitrators with an engineering background who have been

working in this field, as besides these individuals, construction project dispute solutions are unknown. The experts and arbitrators are only aware of the disputes resolution in Saudi construction projects.

4.2.2 Epistemology

Epistemology is the philosophy of knowledge of "how we find out about the topic being investigated". Epistemological assumptions include philosophies such as positivism and social constructionism (interpretivism) as Easterby-Smith et al. (2012).

Positivism in general is stated to be a way of thinking in which the existence of the social world is believed to be external, and instead of using subjective methods such as intuition, sensation and reflection, objective methods are used to measure its properties. The assumption of the positivism philosophy is that the research subject does not affect the researcher, and he is independent of the research subject and also does not affect the research subject (Easterby-Smith et al., 2008).

The focus of social constructivism is to ascertain reality through people and not through external factors or objectives. While comparing social constructivism with positivism, one can understand that the major point lies in the fact that social constructivism emphasizes on world containing subjective consciousness and positivism emphasizes objective reality (Easterby-Smith et al., 2008). In the context of interpretivism, a phenomenon is analysed from the viewpoint of an individual in the context of culture inhabited by people and the intercommunication among them (Scotland, 2012).

Thus, social constructivism assumes that reality by nature cannot be considered external and objective; rather it has a social construction and proves meaningful for people. Easterby-Smith et al. (2012) described the differences between two philosophies as table 4-1 shows.

Interpretivism might be identified as the most appropriate epistology philosophy in this study. Therefore, in this research, this approach has been used to collect data face to face and conduct semi-structured interviews with experts, academics and arbitrators in construction projects in Saudi Arabia, in order to improve the correct description and provide a better interpretive meaning.

Table 4-1: shows how Easterby-Smith et al. (2012) described the differences between positivist and social constructionist (interpretivist) research.

Epistemology	Positivism	Social Constructionism (Interpretivism)
The observer	Must be independent	Is part of what is being Observed
Human interest	Should be irrelevant	Are the main drivers of the science
Explanations	Must demonstrate causality	Aim to increase general understanding of the situation
Research progress Through	Hypotheses and deduction	Gathering rich data from Which ideas are induced
Concepts	Need to be operationalized so that they can be measured	Should incorporate stakeholder perspectives
Units of analysis	Should be reduced to the simplest terms	May include the complexity of the 'whole' situation
Generalization through	Statistical probability	Theoretical abstraction
Sampling requires	Large numbers selected randomly	Small numbers of cases chosen for specific reasons

4.2.3 Axiology

This is the third feature and the last step of the research philosophy that has to be discussed. Axiology concerns assumptions about the value that the researcher appends to the knowledge. It has two sides, namely "value free" and "value laden". The choice of the subject and method of study is different in each case. In "value free" studies, the selection of topic as well as the method of study depends on the aim criteria, but in "value laden" research, what to study depends on the experiences and beliefs of human beings (Easterby-Smith, 2012).

Since this study focuses on the experiences, opinions and beliefs of academics, experts and arbitrators in the field of dispute resolution in Saudi construction projects that were in this attribute, value laden research was chosen in order to achieve the objectives. In summary, the

research philosophy had an impact on the initial design research methodology (Sexton, 2003); see figure 4-2.

The "value laden" might be identified as the most appropriate axiology philosophy research, one in which experts and arbitrators have participated, and which has significantly impacted on the exploration and development of dispute solutions in construction projects in Saudi Arabia.

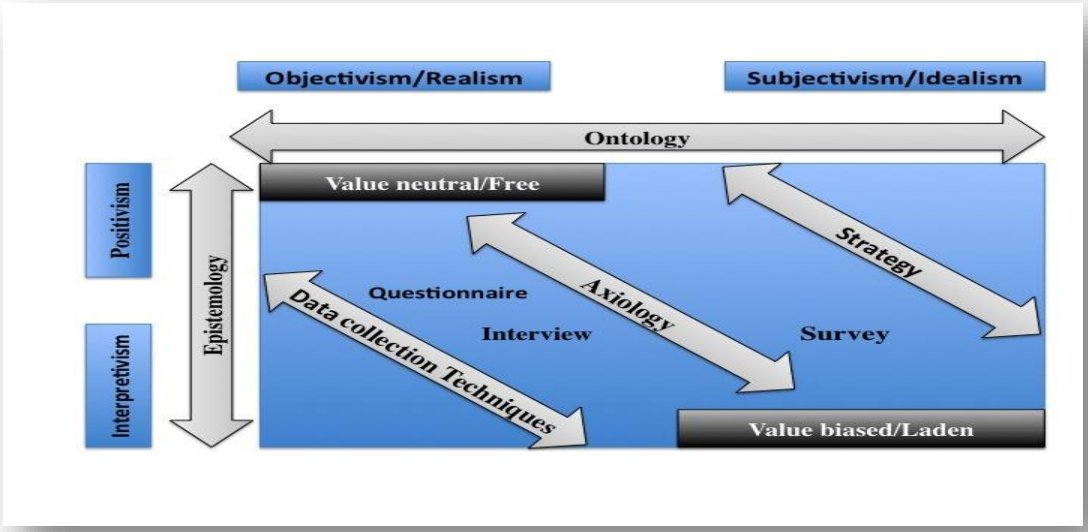


Figure 4-2: The Research Philosophy (Sexton, 2003)

4.3 Research approach

According to Saunders et al. (2012), there are three different central research approaches at the second level of onion research: deductive, inductive and abduction.

4.3.1 Deduction

In the deductive approach, firstly, the theory and formation of the hypothesis takes place and then the tests are conducted on the hypothesis, whereas in the inductive approach, the theory will be framed with the help of the results of data analysis (Saunders et al., 2012). Table 4.2 illustrates the main differences between inductive and deductive approaches according to Saunders et al. (2012).

Table 4-2: Inductive and Deductive Approach: The Key Differences (Saunders et al., 2012).

Deduction	Induction

Flows from theory to specific data	Flows from specific data to theory
It deals with natural sciences	It deals with social sciences
It works with a strict and structured	This approach is quite flexible in
It explores the causal relationships between variables	It reflects that the human attachment with specific events
This approach directs to present generalized assumption	This approach directs to reflect specific conclusion

4.3.2 Induction

The inductive approach while undertaking the qualitative and quantitative research study is related to developing the research building process based on the perception and interpretation of human beings towards the social world (Saunders et al., 2012). In this approach, general conclusions are drawn by initiating the research with the focus on the specific research purpose.

4.3.3 Abduction

Figure 4-3: Inductive, Deductive and Abductive Approach

As a result of this research study, will be used for the abduction of approach is the best approachs for this research where the research where the combined approach deductive and inductive to conduct this research as we initially created a framework of previous studies and then conducted interviews to explore the current situation regarding dispute resolution in Saudi construction projects to develop a dispute resolution framework. Then we went back again to test the validity of the dispute resolution framework. See Figure 4-3: abduction approach.

Approach Abduction has been adopted by the researcher, as abduction allows the possibility to obtain greater knowledge in relation to the participants, which can enable a better attachment and understanding in the context of events. This process moves to data acquisition and analysis

from theory, in order to establish correlations, as abduction uncovers and relies on the most beneficial explanations that define the comprehension of results in analysis formulation. Also, abduction approach will increase the understanding and exploration of dispute resolution method construction projects within Saudi Arabia (Creswell, 2013).

4.4 Strategy

In the words of Naoum (2007), the research strategy can be said to be the way in which research objectives are analysed. This is the third ring of the research onion, where the strategy for research is chosen according to the characteristics of the problem. The most important criteria for choosing a research strategy are whether it will enable the researcher to address the subject matter of the research in a proper manner and also, the research can use qualitative or quantitative or mixed between them (Saunders et al., 2012).

The mixed methods approach has been chosen for this research study. The utility of using both the qualitative and quantitative second methods In this research, the collection and analysis of qualitative data are enabled through the use of an exploratory design so as to use the data to provide a bearing to the quantitative approach. An understanding of the entire research is facilitated through the use of the exploratory design. This design proves to be a significant contributor to this research in emphasizing the possible variables (Creswell, 2013). Figure (4-2).

4.5 Methodological choices

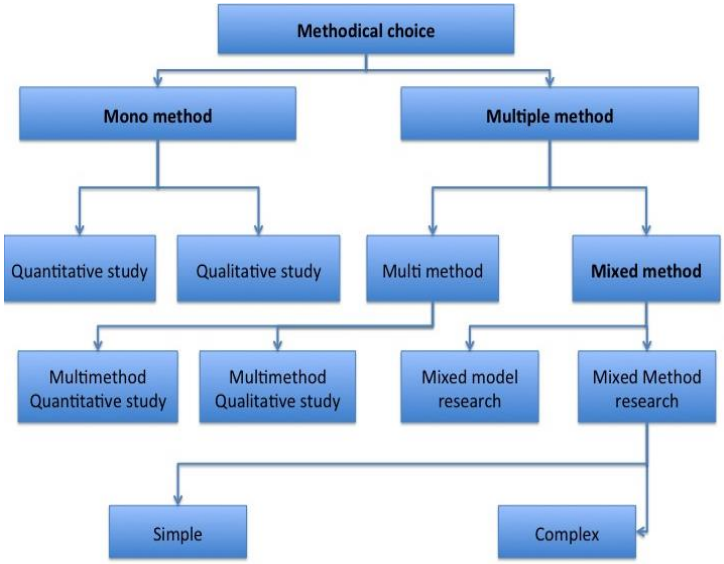


Figure 4-4: Methodical Research Choices (Saunders et al., 2012)

In this section, the method of study can be divided into two sections to be relevant to the reviews: multiple methods and mono methods. As can be seen in figure 4-4 in this study, multiple methods are used in terms of the questions and also the aim and objectives (Saunders et al., 2012).

4.6 Mixed method approach

Although both these methods are effective, there is no need to be restricted to using these two methods only. As per the research philosophy, the blended implication of both qualitative and quantitative methods is known as mixed methodology. It is considered as one of the most significant techniques as it helps in collecting comprehensive and different types of information. The positive and negative perspectives of the mixed method approach can be seen in the table presented 4-3:In the process of selecting suitable methods for the research work, mixed method can be proved to be an effective approach (Saunders et al., 2012).

In the research work presented, an exploratory research design has been used, in which a specific questionnaire was prepared for the purpose of being adapted with the interview. The figure 4-4 shows that the mixed-method approach is time consuming but an effective and developed approach in comparison to other methods. In this design, qualitative and quantitative approaches are used effectively for data gathering and making assumptions regarding the results. With the help of this method, both types of approaches can be possible

In one study, which produces a relatively stronger study and effective results (Creswell, 2009). The aim of the mixed method approach and its adoption for this research was to provide stronger witnesses and a clearer vision on the way of exploration and understanding the dispute solutions used by the experts and arbitrators in construction projects in Saudi Arabia. The research will therefore, employ a qualitative and quantitative approach, so that both of these elements can complement one another. (Creswell, 2007).

Table 4-3: Strengths and Weaknesses of Qualitative and Quantitative Research (Easterby-Smith et al., 2012)

Qualitative and Quantitative

Strengths	*Weaknesses*
✓ Can provide wide coverage of a range of situations. ✓ Can be fast and economical. ✓ Can provide wide coverage of a range of situations. ✓ Data-gathering methods seen as more natural rather than artificial. ✓ Ability to look at change process over time. ✓ Where statistics are aggregated from large samples, may be of considerable relevance to policy decisions. ✓ Ability to understand people's meaning. ✓ Ability to adjust to new issues and ideas as they emerge.	✓ The methods used tend to be rather inflexible and artificial. ✓ They are not very effective in understanding processes. ✓ The significance that people attach to actions. ✓ They are not very helpful in generating theories. ✓ Data collection can be tedious and require more resources. ✓ Analysis and interpretation of data may be more difficult. ✓ Harder to control the pace, progress and end-points of the research process. ✓ Policy-makers may give low credibility to results from a qualitative approach.

4.7 Time horizon

According to Saunders et al. (2012), the time horizons is the fifth layer of the research onion for any research, it could be cross-sectional or longitudinal. Research that investigating a

particular phenomenon at a particular time is called cross-sectional, whereas a research that investigating a change and development over a time period is called longitudinal (Saunders et. al., 2012). Because of the time limit of the PhD period, research is considered as a cross-sectional study.

4.8 Data collection method

The researcher used both primary and secondary data for this study. The primary data consisted of the information that was collected to carry this discussion from people and document while the secondary data was collected from available sources that are relevant to the discussion (Silverman, 2000).

In this section, we discuss collecting data as follows. Firstly, we present the literature review, which examines the impact of disputes, the type causes of disputes, the method of dispute resolution, including an alternative dispute resolution, and finally, the barriers to using the alternative dispute resolution. At the next step, we describe how a semi-structured interview was conducted with academics, experts and arbitrators in Saudi construction projects. Following that, the manner of designing and distributing the questionnaire between the participants is discussed.

4.8.1 Literature review

The literature review consists of subsidiary data such as scientific papers, articles, magazines, thesis, Internet nets and industrial reports. It talks about the impact of disputes on Saudi construction projects and the types and causes of these disputes in Saudi construction projects. After this, it looks at the method of dispute resolution, including an alternative dispute resolution, in the context of Saudi construction projects. It also examines the critical success factors for alternative dispute resolution in Saudi construction projects and the barriers that prevent the use of such a resolution. Details can be found in the previous chapter on literature.

4.8.2 Qualitative data collection

The semi-structured interview involves face-to-face interviews with academics, experts and arbitrators in Saudi construction projects to explore the current impact of disputes, their types and causes, method of dispute resolution and the critical success factors for the alternative dispute resolution, as well as the barriers to using the alternative dispute resolution.

- **Interview method**

The aim of the semi-structured interview is to achieve the aim of the thesis (Saunders et al., 2009). This method will be adopted in the first part of the data collection in the research. It involves interviews with 15 arbitrators, academics and experts in Saudi construction projects and method of questions to be as follows:

In this part, we explore methods of dispute resolution and the critical success factors for alternative dispute resolution, as well as barriers to using the alternative dispute resolution. Adjusting the qualitative data question (semi structured) is as follows: Refer to Appendix 2

First: the general questions asked in the interviews were as follows: the number of participation in solving disputes and the years of experience and classification of interviews according to Bachelor degree. It was realized that all of the interviewees had over 25 years' experience and their expertise was in the field of architecture and civil engineering.

Second: the interviewees were asked, based on their experiences, whether disputes have an impact on Saudi construction projects. In this case, Time, Cost and Quality were the issues that were being affected The Interviews.

Third: the interviewees were asked, in their experience, what were the types and causes of disputes in Saudi construction projects. The disputes that were named formed eight categories: Financial, Contractual, Owner, Design, People's behaviour, Contractor, Project-related and External.

Fourth: the interviewees were asked about the methods of dispute resolution in Saudi construction projects. It became obvious through the given answers that the methods of dispute resolution in the public sector are different to those used in the private sector. In the public sector, the methods of dispute resolution used are negotiation and litigation, while in the private sector; they are negotiation, mediation, arbitration and also litigation.

Fifth: the critical success factors for alternative dispute resolution.

There are 11 critical success factors for alternative dispute resolution in Saudi construction projects: speed, economy, flexibility, confidence, neutrality, and fairness, maintaining relationships and privacy, psychological, reputation and being non-adversarial.

Six: barriers using the alternative dispute resolution in Saudi construction projects

Comprise four categories: Contractual, Culture, Government obstacles, and Development and Rehabilitation obstacles.

- **Interview sample**

To make the questions clear and easy to understand, the interview was designed to be semi-structured in form. Interviews were conducted with 15 individuals, who were academics, experts and arbitrators in Saudi construction projects with over 25 years of experience. See Table 4-1.

The aim was to explore the impact, type and causes of disputes and methods of dispute resolution, and the critical success factors for an alternative dispute resolution, as well as barriers to using the alternative dispute resolution in Saudi construction project.

The average time allowed for each interview was about 30 minutes to gain more information on the types and causes of disputes and methods of dispute resolution in Saudi construction projects. In addition, the researcher represented each interviewee by a letter of the alphabet as a way of keeping interviewees' anonymity as well as matching the content of the search terms.

All of the arbitrators, expert and academics that participated in the research are authorized from the Saudi Council of Engineers (SCE) and the Ministry of Justice.

4.8.3 Quantitative data collection

- **Questionnaire method**

This questionnaire was related to all academics and experts, arbitrators and engineers in Saudi construction projects. The questionnaire consisted of 37 questions in total and was divided into seven sections as follows. Refer to Appendix 3:

The first section: the general information about the participants the information about the nationality and if those work in sectors are with Saudi nationality or none Saudi Nationality. Next, they were asked if they had been confronted with any disputes, and then, if they had participated in solving any disputes in Saudi construction projects. The next question was about the Classification of Responses According to the Saudi Council of Engineers. Then next question was about their experiences and after that, there was a question to classify the participants based on their Bachelor degree. After this, participants were asked which organization they work for, and whether they are an owner, a consultant or a contractor. The next question asked which sector is the

participant working in, public or private. The next question was about their qualifications. The next was about the amount of dangers that a dispute can have through its impact upon Saudi construction projects, and ultimately it was this question that what the satisfied the disputes resolution in Saudi construction projects.

The second section: the impact of disputes on Saudi construction projects. The participants were questioned about the impact of disputes on Time, Cost and Quality. Through this question of disputes, dangers to Saudi construction projects were compared with the impact of disputes on Saudi construction projects.

The third section: the types and causes of disputes in Saudi construction projects. The causes were divided into eight categories and each category (type of disputes) have many of causes divided such as all. First was the Financial, with five causes. The second was Contractual, with seven causes; and the third was Owner disputes, with five causes. The fourth was Design disputes, with two causes; the fifth was People's behaviour disputes, with six causes; and the sixth was Contractor with seven causes. The seventh was Project-related, with three causes; and the eighth was two External. Finally, there was the last question, which was to compare the causes of disputes with years of experience of participants.

The fourth section: the methods of dispute resolution in Saudi construction projects. In this section, the questions were in four series:

- First question: comparing methods of dispute resolution in government upon those individuals working in both public and private sectors.
- Second question**:** comparing the method of dispute resolution in non-government with those who work in private and public sectors.
- Third question: this was about the method of dispute resolution in the private sector, and the times taken by each method were compared.
- Fourth question**:** a comparison between the cost of each method of solving disputes in both sectors and the participants' education level.

The fifth section: ranks and analyses the critical success factors for Alternative dispute resolution.

The sixth section: ranks and analyses the barriers of using Alternative dispute resolution in Saudi Construction Project

The seventh section: comparison between the methods of dispute resolution in Saudi construction projects with type and causes of disputes: there were eight questions under this section that were related to comparing the cause of disputes with the individuals with Bachelor degree.

- **The questionnaire design**

The analysis of the qualitative and quantitative data will depend on the design of the questions, since the questionnaire was designed based on classification and also the power of the questionnaire was driven from the power of those questions (Saunders et. al., 2012). From classified questions, and ranking and rating, a five-point Likert Scale ("strongly disagree, disagree, undecided, agree, strongly agree") was used, and that helped participants to decide more easily by providing a variety of choices.

- **Pilot study for the questionnaire**

Following the stage of designing the questionnaire and before distributing it, the questionnaire was checked and forwarded to a group of 10 experts, arbitrators and engineers to ensure that it was clear and easy to understand by any readers. Following collecting their points, the questions were reviewed and corrections were implemented, and then the questionnaire was distributed.

- **Questionnaire sample**

Sampling for questionnaires aims to select participants for the investigation and reduce the overall amount of people that are required to be interviewed or complete a questionnaire. Various sampling techniques are possible and were outlined, such as: probability, quota and snowballing (Oppenheim, 1992). In particular, snowball sampling is useful when none of the characteristics of a population are known, as it becomes impossible to devise a sampling frame in this scenario, as the target population dynamics fail to materialise. Therefore, there is only a partial or totally inaccurate representation of the population, even following the use of multiple methods.

Table 4-4: Questionnaire sample

Responses	Responses received the questionnaire	Responses in Public sector	Responses in Private sector	Responses who filled questionnaire
No	900	213	114	327

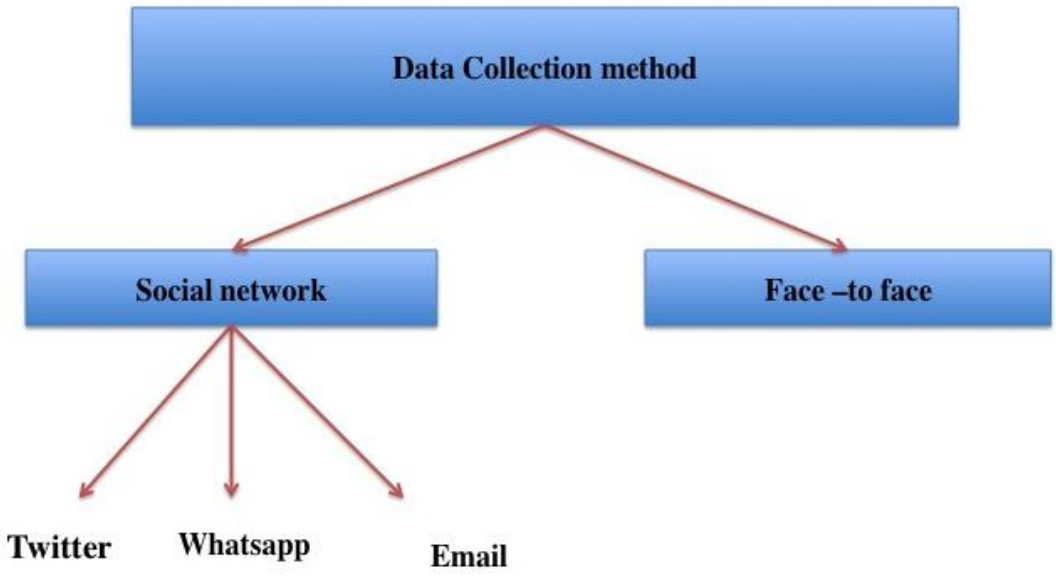


Figure 4-5: Data collection method

The snowball strategy was used to collect samples, which involved backing others by means of personal connection. The data was collected by various methods, such as face-to-face interviews. and by social networking (twitter, WhatsApp and email), see figure 4-5 (Saunders et. al, 2012). The questionnaire was distributed between experts, arbitrators and engineers involved in Saudi construction projects. The number of sample size is 900 participants. The number of those who completed the questionnaire was 327, and from this figure, 213 of the participants worked in the public sector in Saudi Arabia, with the remaining the 114 participants from the private sector, see table 4-4. Survey Monkey was also used to collect data, and was distributed to the participants. Collecting the date from the questionnaires took eight weeks, and during this period, reminder letters were sent to participants three times. By using the Internet to complete the questionnaire, this technique enabled the researcher to reach out to most sectors of people in a short time frame, however, it should be noted that the rate of those who answered the questionnaire through this method was relatively low when compared to the other methods employed in the study (Saunders et. al, 2012).

4.9 Data analysis

Based on research design, the target group were academics and experts working in the construction sector in Saudi Arabia, and who had a connection with the public and private sectors in the Saudi construction industry. The Saudi Council of Engineering is known as a semi government department and possesses a list containing all the names of arbitrators, experts and engineers who work in this field. The intended groups for this research were those individuals who were registered with the Saudi Engineering Council. The intended groups could be divided into two major sub groups, the first of those being experts, arbitrators and academics, the second group being with engineering experience in the construction sector, with individuals from both groups being registered with the Saudi Council of Engineering. In order to develop a dispute resolution framework for construction projects in Saudi Arabia, it is necessary to analyze quantitative data. Hence, the reason a questionnaire was designed to review and evaluate the factors that provided the method for this analysis.

For this phase, data processing with respect to the responses gained from the questionnaires and interviews was undertaken in order to establish reliable and useful information for achieving the research objectives. As the present research study adopted mixed methodology, the data analysis process required different techniques (Edmonds and Kennedy, 2012). For the process of data collection, several methods can be adopted together or separately based on the nature of the research. However, amid the various advantages of the research tools and techniques, identifying the research limitations is of critical importance in better understanding the applied methods and techniques. With respect to the present research, priority has been given to the qualitative methods as compared to the quantitative element.

In this essence, six methods were highlighted by Crowther and Lancaster (2012) for undertaking the process of data analysis: argument analysis, conversation analysis, narrative analysis, discourse analysis, grounded analysis and content analysis. In grounded analysis, empirical data is considered for determining views and perceptions, thereby not taking into account pre-determined roles. Qualitative data obtained from the interviews had been recorded and written prior to analysis, as the interview sessions were transcribed and proof-analysed at various times, in order to summarise the content into specific manual themes and codes of data through the use of colour coding. It was stated that data transcripts need to be analysed to acquire incidents and facts, which are subsequently coded with short phrases or words (Coyne and Cowley, 2006).

These codes were utilised in order to demonstrate each individual data section in a descriptive manner, although instead of line coding (Coyne and Cowley, 2006), selective coding was carried out. As a consequence, manual coding utilised the colours for the individual transcript lines and placed the data analysis content into 6 common themes, prior to them being divided into specific sub-categories. On the other hand, in content analysis, the classification of ideas and structure is undertaken with data resting (Crowther and Lancaster, 2012). Well-defined questionnaires were also employed in the research so as to attain a wide scope for conclusion. Research-centric questions were provided to engineers, experts and arbitrators in the SCE to gain first-hand and practical research knowledge. After the collection of pertinent data, the data analysis process was undertaken.

The principle characteristic of the Interpretative Structural Modelling (ISM) method stems from its complexity, which is dispersed into various subsystems of individual experiences and knowledge, together with the assistance acquired from the computer system. The developed methodology for ISM utilised expert knowledge during the process of construction, as well as academics that derived correlations between potential measurements of performance that could create an element of bias. This methodology is suitable for professional employment when challenges are required to be met (Agarwal et al., 2007). This method is derived from qualitative analysis and works with several variables, which function in relation to the structural model, resulting in a complex system analysis.

In fact, there is a method to classify the critical success factors for the disputes resolution method. It should be noted however, that while one method has been chosen, there was in actual fact, more than one method, such as the AHP method this arranges the relationship between factors in one direction that is vertical and the ISM model sets the relationship between factors vertically and horizontally and also analyses their inter relations.

4.10 Data validity and reliability

In the perception of Creswell (2013), the quality and objectivity associated with the data collected play a significant role in deciding grave research elements, such as research validity and reliability. The reliability of the interview method can be restricted in the presence of bias, which is mitigated by the adoption of the triangulation method. The need for reliability and validity is particularly crucial for qualitative research studies wherein the possibility of the research being manipulated is greater (Creswell, 2013). This requires for an independent review, which can be undertaken by experts in such content, who are well aware of the reviewed

topic so as to make judgments regarding the use of the data-collection methods. In the context of the present mixed-method research, limitations associated with a particular research method have been mitigated by the advantages of the other method. For this purpose, the data has been collected with the help of semi-structured interviews, as well as questionnaires.

4.11 Ethical consideration

In this review, which was conducted about the SCE in Saudi Arabia, ethical consideration was highlighted. It was emphasized that it is of essential of university at the stage of PhD . It is essential that it should be kept undisclosed and to make it not to be clear that the opinion given belongs to which one of the participants. To prevent personal verification, we have dedicated a code for each participant to ensure.

The researcher is required to ensure research credibility, as the individual participants all have to receive an invitation letter, which presents the researcher, provides an outline of the topic at hand, and gives a specific, clear invitation to participate. The entire process of participation must be voluntary and without any form of coercion. Meanwhile, the participants have to be notified that they are able to refuse from participating and hold the right to withdraw at any moment during the study. Connection with participants was conducted by means of meeting face-to-face, Skype, email and telephone conversation to collect their opinions and have their attention for our investigation. It was emphasized that their participation would be kept unrevealed, the review was being conducted for the purpose of investigation and after completing the review, in accordance with university ethics, they would no longer be involved.

4.12 Summary

In this section, mixed method was used to reviewing. And it is assorted into six sub-sections. The Reasons, Methods, Use of Methods, Strategy, Time horizontal and Technology of Collecting Data (Saunders et al., 2012). The review was about details of programing the review, and the statistics of philosophy. A constructive research approach was used. Then the type of review and how to achieve the aims was reviewed. The types of collecting data was also reviewed, which were as follows: collecting a great deal of data from interviewing a vast range of people, and in addition to that, the questionnaire, which covered a vast range of people and added lots of reliable data. Finally, there was enough information to indicate the method of analysis.

Chapter 5. Qualitative Data: Semi-Structured Interview

5.1 Introduction

This chapter will discuss the results of qualitative research from Saudi construction projects conducted by academics, experts and arbitrators in the Saudi council engineering (SCE) and the analysis will be considered in the context of the following section classifications; (i) research interviews, (ii) the impact of disputes on Saudi construction projects, (iii) the Types of Disputes' causes on the projects, (iv) method of dispute resolution, (v) the critical success factors for alternative dispute resolution and (vi) barriers to the use of alternative dispute resolution in Saudi construction projects.

5.2 Research Interview and analysis

It is proposed to describe and explain the major aspects of research interview in areas pertinent to this study. All data is collected by means of semi-structured interviews, inquiry method which combines a pre-determined open questions that require discussion, and the interviewer can explore particular aspects of the enquiry further. The twenty five interviewees were selected for their considerable years of experience and qualification in scientific and practical field of construction management and were Saudi council engineering approved practitioners, enhancing the quality of their responses and opinions. Interviews were conducted in Arabic to facilitate the flow of information and opinion.

The purpose of the interviews was to examine the potential for improved efficiency of dispute resolution in Saudi Construction Projects based on the views of those integrally involved in the industry. In the opinion of the researcher, based on examination of existing literature, the Kingdom of Saudi Arabia lacks substantive research in this area of commerce. Having identified the appropriate body of experts in relevant study fields it was however somewhat problematic making contact due to their engagements in engineering duties or supervising commercial projects. It is also the nature of such research that, perhaps due to commitments, some of those approached failed to reply to telephone messages and emails. Others were unable to participate in the semi-structured interview process, but did indicate they would assist in completion of the pre-prepared questionnaire, which was estimated to take up to ten minutes.

Appropriate consents were received from academics and arbitrators with engineering background, the interviews were conducted, geared to the convenience of the volunteers, either face-to-face, Skype or by telephone. The duration varied, with the shortest at 40 minutes long

and the longest 1 hour and 25 minutes. The emphasis of the interview discussions was on the exploration of the knowledge and utility of dispute causes and resolution in the context of Saudi construction projects, particularly on the topic of methods alternative to litigation. All interviews were recorded in the first language of the interviewees and translated into English for the purpose of this study. Subsequent analysis was thereafter conducted to identify value to understanding the availability and value of ADR procedures.

In addition, figures are presented through the analysis to illustrate the principle themes that were found from the qualitative semi-structured interviews, as well as their categories and sub-categories. The themes were developed from a base of thematic analysis from the translated transcripts and verbatim quotes, as the recordings of the interviewees were placed into a coding system, which assisted in developing the majority of chosen words and phrases that were stated by them.

Table 5-1: Interviewees' profiles

Interview	Code	Organisation	Years of experience
1	Ac1	Academic	35
2	E2	Expert	30
3	A3	Arbitrator	35
4	A4	Arbitrator	38
5	E5	Expert	35
6	Ac6	Academic	25
7	A7	Arbitrator	35
8	E8	Expert	40
9	A9	Arbitrator	35
10	E10	Expert	25
11	A11	Arbitrator	25
12	A12	Arbitrator	40
13	E13	Expert	35
14	E14	Expert	54
15	A15	Arbitrator	44

In order to facilitate contact with persons of considerable experience in the construction industry and to assist in the conduct of this research, the SCE provided the author with a list of its approved academics arbitrators and experts. Contact was made with a number of potential interviewees and those who responded are listed table 5-1 above, along with the department of the SCE which accredits their expertise. They were coded to facilitate reference to the results of their interviews.

5.3 The impact of disputes on the Saudi construction projects

This second section will consider the results of the interviews insofar as the experience of the participants reflects on the impact of contractual disputes on the progress of Saudi construction contracts, using their experiences as part of the evaluation of avoidance and resolution methods. Particular aspects of time, cost and quality are considered as broad categories of impact affected directly or indirectly by disputes. opinions varied between the interviewees, some highlighting issues of time, cost and quality on different levels of significance and priority in Saudi construction disputes.

5.3.1 Dispute Impact on Time

It was noted in the interviews that the impact of contractual disputes, of any nature. Was considered of more significance than on cost. Ac1, an experienced arbitrator, indeed explained that impact time is direct in its effect on the project because they have the potential to bring it to a halt completely; as such, it was necessary to resolve issues at the earliest opportunity. E2, a renowned construction expert shared that point of view, asserting that "*when a dispute takes place, the owner and contractor lose their trust in each other and that will cause them not to play their roles*". Interviewee A12, an arbitrator, added that a project manager will be successful if he considers time as the most important factor to him whether there are any disputes or not because, again, delay can damage or stop the project. Ac6 opined '*regretfully, a dispute causes the stoppage of a project until the dispute is resolved. Solving a dispute may take a long time. Most importantly, court procedures take a long time. It may take over five years. I always wished to have ADR for dispute resolution, in order to reduce impact on project progress due to disputes and avoid having projects stopped because of their impact on all parties' relationships.*' A15, another arbitrator, however digresses from this viewpoint, considering that the impact on time measures less than the additional cost to a project in resolving construction disputes. E5, an experienced construction expert and manager added that although disputes have an impact on the time, a project is delayed, this is indirect.

Figure 5.1 below illustrates the relationship between interviewees and number of times they have been involved in construction disputes and their resolution in the course of their work and the impact of the time.

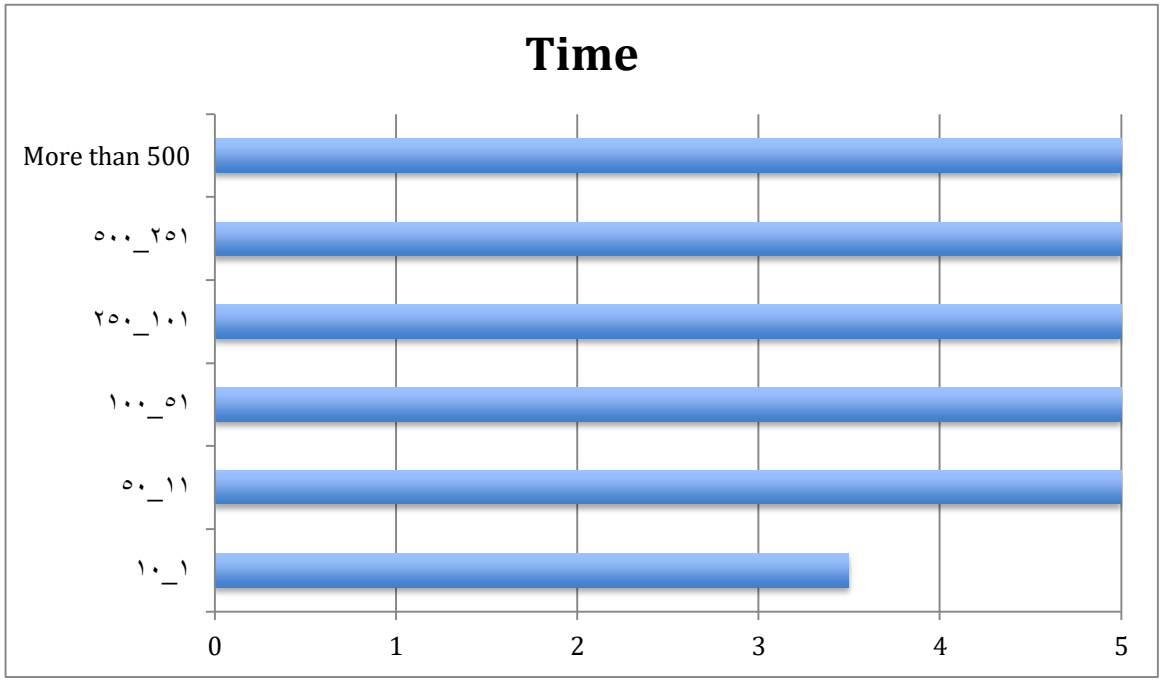


Figure 5-1: Interviewees' relationship to the number of resolving disputes with time

The rate is from 5 to 1. Number (5) indicates very effective; number (4) indicates effective; number (3) indicates medium; number (2) indicates none-effective and number (1) indicates very none-effective.

Each individual interviewee has been involved on at least 11 occasions in conducting and resolving construction disputes of differing, but significant impact on aspects of a major project. Impact on time is generally considered more significant than on rather cost and quality. Those with, fortunately, less experience of the disruptive nature of disputes consider impact on the time taken to move the project on, consider it to be important, but perhaps less so than the other cost and quality factors.

5.3.2 Dispute Impact on cost

Most of the interviewees weighed the impact on cost as broadly similar to that on time, identifying a direct relationship between the two. A11 (arbitrator) stated that: "*due to the direct relation between time and cost, the impact of disputes on time is high and time is impacted upon more directly. Cost will also be affected by the delay caused by disputes*". E13, an expert in fulfilling construction projects, added "*Disputes have impact on cost and more importantly on*

contractor, but I do think it will have as significant a cost impact on the owner because that owner has a budget for the project and he will not accept to increase it".

A12, an arbitrator suggests cost is impacted upon as much as time, and the impact is similar: there is no dispute without physical cost. This view is shared by arbitrator A8 as time and delays as a result of disputes will increase the costs of the project to the detriment of contractor's profitability and project benefits.

A12 added that in government construction projects it is the state rather than the contractor who is responsible for litigation and its cost, but there are indirect expenses for substantial lawyers' fees and experts' involvement. Ac1 (academic) disputes this assessment, explaining that costs are inevitably high where public projects, and indeed most of private construction projects in Saudi Arabia remain resolved by the lengthy litigation process. Time and delay cause financial and economic loss for all parties, including that attributable to the changing value of money as a result of exchange and borrowing charges. Simply, the cost of bank related finance and loans increases with each delay, affecting the viability and profitability of the project. A7 (arbitrator) and E5 (expert) concur with opinions on the substantial impact of disputes on project cost over the effect on time and delay.

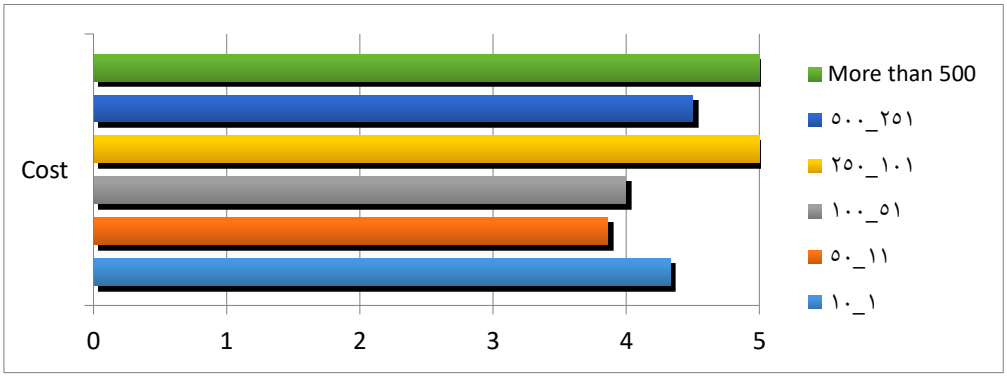


Figure 5-2: Interviewees in relation to the number of resolving disputes in cost

Figure 5.2 illustrates the number of participations who took part in disputes and its relation to the impact of cost on disputes. The rate is estimated from 1 to 5. Number (5) stands for very effective; number (4) stands for effective; number (3) stands for medium; number (2) stands for none effective; and finally number (1) stands for very none effective.

It is noted from Figure 5.2 that interviewees who were involved in the resolution of over 101 to 250 disputes, as well as those with considerably more experience and in excess of 500 dispute resolution decision-making processes consider the impact on project cost to be most significant.

Those involved in the other ranges of dispute experience consider the effect and impact to be somewhat less on cost, whilst those with relatively little experience view cost impact as much less significant than other factors.

5.3.3 Disputes Impact on Quality

The impact of disputes on time and quality will damage trust. E2 (expert), a construction engineer integrally involved in making projects achieve their aim, stated "*the trust will have a lot of impact on quality during a dispute so that whenever the trust is gone, it will affect the project and nature of the works that will be carried out. The contractor will also suffer doubts about doing his job and fears will shake confidence*". A11 (arbitrator), E8 and E2 (both construction experts) shared the same view that trust between contractors, parties and workers is the most important factor in the pursuit of quality of the project going from the outset to the end. Interviewees E13 and A12 asserted that the impact of disputes on quality was as important as that on time and cost. It is hard to ignore the potential impact on quality, argued A6; the "loss of trust necessarily has a high impact on quality due to failure of trust".

E5 however differed in his assessment of the effect of disputes on construction quality, indicating that it was his experience that "there might be disputes without any impact on quality." A3, (arbitrator), concurred; "*it is true that disputes may have some impacts on parts of the productive section of a project, but it doesn't mean that it will have impact on every productive aspects of a project. That is why quality is not necessarily significantly adversely affected by dispute in comparison to other problems*." A7 agreed that decline in quality is not a direct effect of disputes. These assessments are however contrary to the mainstream views.

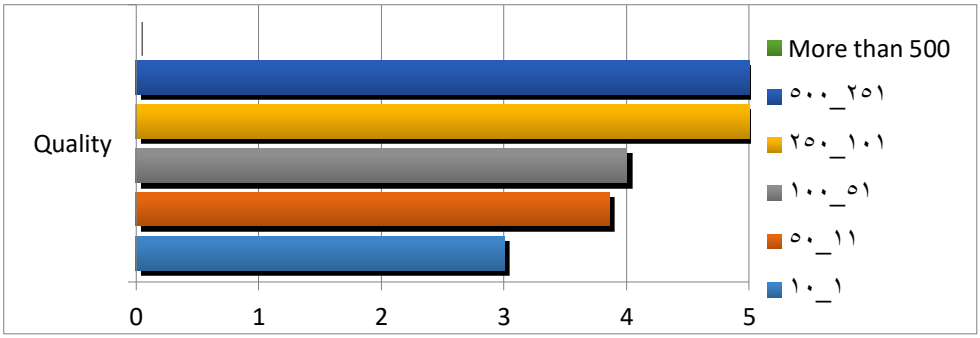


Figure 5-3: Interviewees' in relations to the number of resolving disputes with quality

Figure 5.3 illustrates the number of times interviewees have been involved in any dispute resolutions and their views on the impact on quality. The rate is from 1 to 5. (5) Stands for very

effective; (4) stands for effective; (3) stands for medium; (2) stands for none-effective and number (1) stands for very none-effective.

It is noted that those with the most significant experience of involvement in disputes believed the impact on quality to be high. The level of such experience is significant, because those with only shorter periods of involvement still consider the impact important, but not to the same extent as their more experienced peers.

What is evident from the expert assessment of impacts of disputes on Saudi construction projects is a broad agreement that they impact on time, cost and quality, albeit to different levels. Most interviewees agreed they had a high impact on time although those with less experience of involvement, under 10 instances, held a different view of the impact significance, considering it to be less important. Interviewees differed in their views about the impact of disputes on project and party cost. What was more apparent however was the direct relationship between both time and cost, considered more significant than their individual impacts. On the issue of quality, there is a gradual reduction in the belief of its significance depending on the experience of the interviewee in the conduct of disputes, those with the most believing the impact to be high, those with less considering it of relatively reduced importance. Nevertheless, if trust is lost the quality of work drops. Figure 5-4 below portrays the interaction of the different issues.

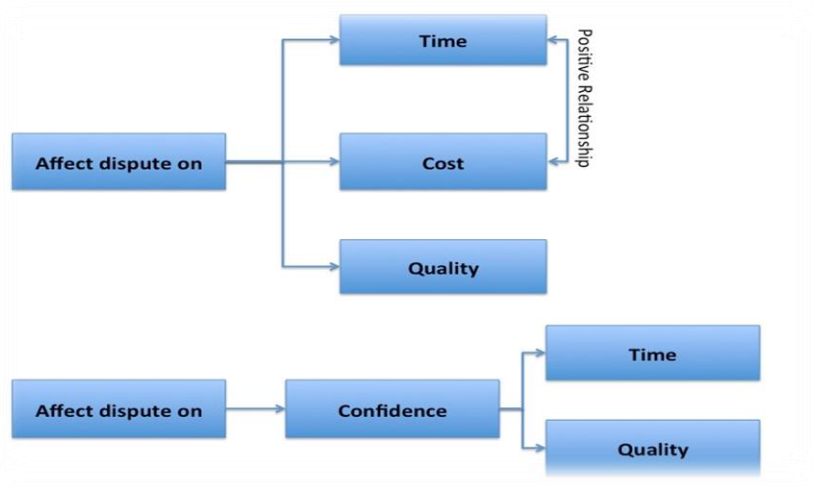


Figure 5-4**:** Disputes' relation to time, cost and quality

5.4 Types of Disputes' causes

Interviewees were asked about the types of disputes and their causes in Saudi construction projects based on their experience. Eight categories were identified for examination: (i)

financial disputes, (ii) contractual, (iii) project owner, (iv) design, (v) people behaviour, (vi) contractor issues, (vii) construction project related and (viii) external disputes.

5.4.1 Financial disputes

In relation to this source of dispute, A9, an arbitrator, stated in interview that such disputes were one of the main reasons causing "*delay in acquiring approval*" as well as the late of payment by the owner to the contractor or subcontractors. Interviewees A3 and A8 concurred, suggesting "*many of the contractors complained of late payment*". E10, an expert integrally involved in the operation of complex construction projects complained "*financial planning is not enough for the project in the Saudi construction projects*." A7, a dispute arbitrator, asserted that delay in acquiring approval is another reason for financial disputes.

A13 commented that delay in the operation of the project led to potential increases in the prices of materials, supported by E14 who did not believe there was sufficient control over pricing by the Ministry of Commerce. A4 somewhat ominously referred to the "wrong calculation" in preparation as a basis for financial disputes. Interviewee E5 followed up on that assertion; "*financial planning is not enough for the project not from the point of the owner or the contractor in addition to the late of payment as well as the causes that you always get*".

5.4.2 Contractual disputes

There are numerous ways a contract for construction projects can give rise to disputes by the very nature of their complexity. Ac1 and A13 suggest that using contracts 'incorrectly', an assessment based no doubt on personal opinion, is the most important cause of contractual disputes. "*Some users take wrong advantage of a contract, and this will simply end up with disputes between the concerned parties",* states A13.

The most obvious cause of disputes is an alleged breach of the contract. Interviewee E2 asserts that breach of contract in Saudi construction projects regrettably occurs often, particularly in engineering projects. This, according to A4 and A11, generally arises from a disagreement in the interpretation of contracts, especially on risk allocation; A4 states 'this is a good reason that the government should develop a standard contract'. Failure to manage the operation of contracts is a major cause of disputes, according to E14 and A11. Interviewee A6 considers the inadequate clarity given in contract drafting to risk allocation is a significant cause of disputes, leading to ambiguous contractual documents, according to A12.

5.4.3 Owner disputes

According to interviewees A14 and E13, the most significant causes of owner disputes are the "verbal orders" and ‘change orders’. Project owners apparently consider it preferable to talk directly with the contractor without documenting the instructions, which inevitably gives rise to future misunderstandings about the agreed terms of contracts and projects. E13 also suggests that the sudden and rapid change of the owner or representative instructions, without planning, makes disputes in the projects difficult to avoid or accommodate, especially when they "*increase the scope of business requests of the contractor*". A10 is concerned with the ‘excessive’ nature of ‘new’ requests. Such a view of what is essentially owner interference in the contractual agreement is supported by interviewees E5, E10 and A11, so far as ‘verbal orders’ are concerned, and by Ac1 believes in the context of "change orders" which alter the requirements of the project, a potent source of subsequent disputes.

Such relatively informal methods of involvement in project management by owners has the potential to damage relationship building and trust between the parties, resulting in disputes, according to A6; "*building a good relationship between the owner and the contractor is very important as well as the trust because it is reflected through continuously work without disputes*.’ Interviewee A12, an arbitrator, and E2, an expert who works directly on the construction project, bemoan the effect an‘uncooperative owner’ and their failure to build and maintain trust has on a project and the avoidance of disputes.

5.4.4 Design

Two significant causes of project design disputes arose in the interviews; (i) Ac1, E14, A7, A11, A15, E5 averred that the most important cause, in their opinion, in Saudi construction projects, was "inadequate design", with (ii) interviewees E2, E10, Ac6 and A11 arguing "design error" as the principle cause of disputes on this issue, often arising from insufficient time or attention to detail, be it of the project particulars or the site examination itself.

5.4.5 People Behaviour

Some 6 aspects of the behaviour and conduct of those involved in the planning and operation of the project were identified which gives rise to disputes and the impacts which follow. (i) A15 sees the first as "*failure in decision-making*" as a significant cause, and indeed interviewees E13 and A12 agree that such failures, especially by the project manager or other principle

decision maker is a major cause of dispute in Saudi contracts effectiveness. E8 believes this may simply be a "*lack of experience*" on the part of the decision-makers.

(ii) Interviewees E5 and E10 regard '*poor communication'* as another important cause of disputes. E5 stressed that '*communication is an important issue for a project, and indeed 90% of a project manager's time is used for communication'* because, according to E2, knowledge, or the lack thereof, is considered a fertile source of disputes. E2 adds that *"understanding about the details of a project and management are is very important to its success*".

A3 has a different perspective on the cause of disputes arising from problematic interaction between participants in the operation of the project, stress that lack of team spirit as a major cause of disagreements and disputes, which A4 believes leads to a decline in motivation, 'a critical success factor in managing a project.' Indeed A15 asserts "lack of team spirit' can have a surprisingly detrimental effect on the progress and success of a construction project due to its effect on the conduct of the contract participants.

5.4.6 Contractor disputes

The conduct and effectiveness of contractors in the carrying out of project works has been a source of different forms of dispute in the way a project is managed and run. The inefficiency of site management, monitoring and control is identified by E5, E13 and A6 is considered a particularly potent source of problems. The general criticism of lack of efficiency is remarked upon by interviewees E8, A11 and E2. A11 comments that 'in the recent period there has been a lot of reliance on the local contractor in the running of public project who in fact are not efficient enough for the task, and this ineffectiveness is a major reason for disputes.' Interviewee A6 adds: "lack of control of the site by contractors is a common problem and affects the quality and leads to a potentially poor product". Lack of competence of contractors in the ground level management of a project is identified by A12, and A7 commented that "many of the contractors involved in bids in Saudi construction projects are not concerned about their reputation and, therefore, they are not suitable to run projects because they take insufficient pride in their work".

Manpower is often insufficient, according to E5 and E10, and A10 further remarked that *"many contractors do well at the beginning and they are acceptable, but at the end of a project, effort becomes less, there is delay and that causes contractor disputes*." Poor implementation, lack of experience and inadequate manpower, matched by ineffective monitoring and control of the

site as far as working practices and even access is concerned, are identified as sources of disputes, with their associated impacts, by the other interviewees.

5.4.7 Project Related

Many of the project related problems are identified as arising from inadequate completion of documentation for the works, A15, and failure of delivery of the physical materials to actually construct, A7, E10, E14 and E3. Interviewees E3 and E10 particularly complained that failure to provide the necessary basic materials to build will result in the project may be delayed or stopped, causing not simply disputes, but the financial, quality and time impacts identified above. Partial delivery can be as damaging to the smooth operation and progress of the project, and indeed there are potential reflections on the adequacy of planning at the start; the materials have to be available on the market and sourced for their adequacy in the fulfilment of the contract. It is pertinent that the most critical opinions noted on this issue are provided by expert construction workers and managers who have to deal directly with the problem on site and in planning.

5.4.8 External Issues

Two particular matters were highlighted by respondents in generating disputes, even though they were essentially outside of the control of the parties. E10 and A5 pointed out problems with unexpected weather conditions. A5 particularly pointed out that in Saudi Arabia the temperature can reach 50 degree Celsius, thus affecting the ability of employees to work on the site and indeed materials such as concrete require milder temperatures in order to be downloaded. Interviewees A15, A3 and E10 consider the need to be wary of the "higher change policy" in the causation of problems and disputes with the project, whereby new government instructions are issued suddenly and without warning which can arrest the development of projects. Such orders are outside of the control of parties, but nevertheless harm progress, leading to complaints and disputes.

Each type of dispute outlined above leads to serious financial consequences for the parties and the project in the form of late payment, inadequacy of future financial planning, delays in acquiring approval for each part of the project, a market increase price of the materials and other general consequences of calculations which have to be revised. This potentially leads to various different categories of contractual dispute requiring different methods of resolution, from general breach of terms, ambiguity, failure to manage to issues of financial risk allocation

and ad hoc verbal change orders. These all make the initial process of bidding for a contract less attractive to businesses.

There is a potent well of dispute potential in the drafting, changing and operation of large, complex construction contracts which generally arise from a lack of attention to the formulation of aims and goals of the project. It is noted by respondents that this arises from a lack of experience in the preparation and knowledge of what is required to put together a well organised plan of action at the inception of the project. This leads to disputes around design error and inadequacy of design type, failures in decision-making and poor communication between the parties during its operation which damages team spirit and motivation. In turn, this causes profoundly damaging effects, according to respondents, of contractor inefficiency, poor implementation, delay of achievement of formative goals, insufficient manpower and monitoring and control of the site, including the ability to adapt working practices to material delivery problems and working environmental change. The broad classification of dispute sources is outlined in Figure 5.5 below.

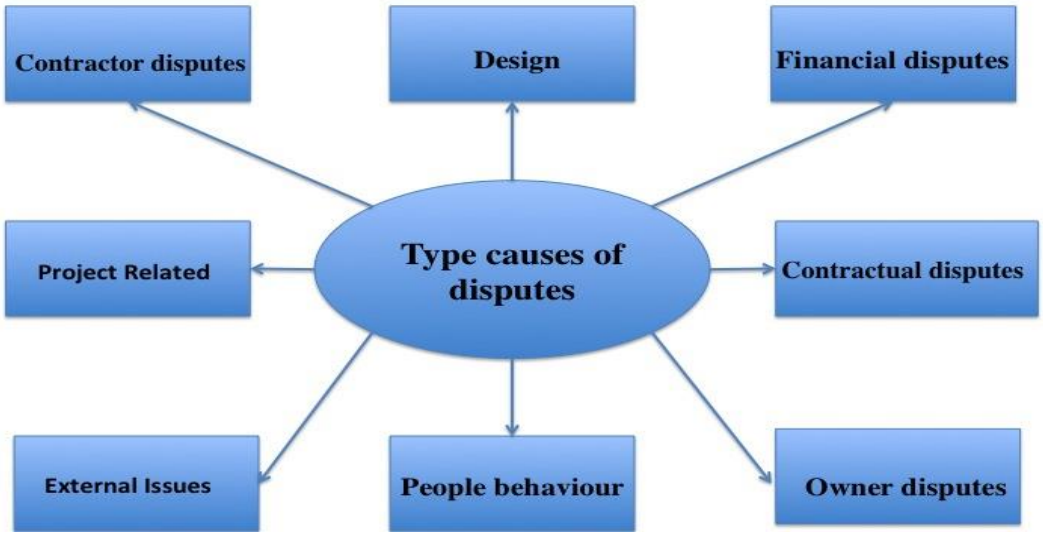


Figure 5-5 :Type causes of disputes in saudi construction project

5.5 Dispute Resolution method

In this section, methods of dispute resolution in Saudi construction projects are considered in the context of (i) litigation, and (ii) alternative dispute resolution via negotiation, mediation, DAB and arbitration. The utility of such dispute resolution methods vary between the public sector, which involves the state or its agencies as a party to the contract and tend to seek

resolution by negotiation or litigation, and the private sector, which makes use of the wider range of ADR processes.

- **Litigation**

Litigation remains a common method in the resolving of disputes in both private and public sectors of Saudi construction enterprises according to respondents. Anecdotal opinion abounds from the research contributors. Interviewee A11, supported by the opinions of Ac1, A12 and A9, asserted "*most of construction projects disputes in public and private sectors are solved by litigation. This is because the legal system in the country does not allow using any other methods to solve any disputes in public sector. This is possible in private sector. The reason is cultural awareness".* A7 stated "*all of the disputes in Saudi construction projects in private as well as in public sectors are resolved by means of litigation and that is a waste of time and money. Some cases last as long as five years and the cost of lawyer and expert reporting is high*".

A6 concurs to a more limited extent; "*litigation has a dominant role in resolving disputes in Saudi Construction Project, but other methods are also used to resolve dispute in construction projects*". Solving disputes using litigation is often not the most suitable method for many of the reasons outlined above, the most pertinent cost and time, and indeed the judge is unlikely to be familiar with many of the details in a specialist engineering project. A12 remarked that "*solving disputes using litigation in private and public sectors is a basic method, but it involves indirect expenditures and considering the time it takes, it is not therefore the most useful. We know that litigation is free of charge but there are indirect expenditures such as lawyers' wages and the expenses of experts' reports from the engineering bureau*".

- **Experts' reports**

Expert reports dealing with particular elements of disputes form a significant part of litigation in Saudi Arabia to assist a judge in his decision-making on matters which are unlikely to be within his own expertise in the construction industry. Ac1 asserts that '*in most of the disputes in Saudi construction projects, the judge will ask for assistance from the Consulting Engineering Office (CEO) and engineer experts*.' A7 confirms this is common practice in court based litigation, and '*the expert is usually a representative of the CEO and Engineering Arbitration Centre in the SCE*.' Interviewee A13 adds: "*the Engineering Arbitration Centre in SCE tries to keep in regular, timely communication with the Ministry of Justice to ensure that the forwarded report will be of the quality required, particularly because arbitrators and*

experts dealing with the opinions therein have high levels of experience and capability under the umbrella of specialised engineering project administration." A11 is however critical of some purported CEO expertise in the area of problem analysis in particular project problems due to lack of their own professional capabilities and conformity with the requirements of a professional body, He adds that the cost of experts' reports is less compared to those of the SCE, suggesting less experience and professionalism in their preparation.

- **ADR**

In this section different methods of Alternative Dispute Resolution utilised in the Saudi construction projects are considered separately.

- **Negotiation**

In Saudi construction project disputes, negotiation is used in both public and private sectors. A12 notes '*that is free of charge and its duration may not exceed a month.*' It is however apparently rarely used to its full beneficial effect, according to E13. Interviewee A6 added that: "*through my long experience, I have not come across negotiation as a means of resolving disputes in private and public sectors but litigation was mainly used as method of resolving disputes*". Interviewees believed that resolving disputes by means of negotiation differs from other methods in that does not take long time and the cost is low compared with other methods; A4 adds "*if the both sides of a dispute started using negotiation more often, they may no more be in need for other methods*.' E2 concurs: *"negotiation is a developed method and it is based on knowledge and understanding of both parties of disputes. In my perspective, it should be considered as a preliminary method of resolution and it may take only a few hours and will not cost anything at all.*'

- **Mediation**

Mediation is more broadly used in the private sector in Saudi construction projects rather than in public disputes in which the state or its representatives are involved. It is acknowledged by most respondents as the most effective method of solving disputes in the SCP. E15 states *"mediation is a method of much flexibility and it is simple. In my experience, its duration is short and it does not exceed more than 3 months. It costs little. Sometimes it is as little as a tip. It is not used very much. There is no reason for not using it, unless the social culture is preventing that*". Ac1 says "*mediation is the best alternative disputes resolution, but regrettably arbitrators or experts who try to use mediation feel embarrassed. Since all parties anticipate*

in the mediation free of charge, this is a negative point for mediation in my point of view." It appears that what is preventing mediation to be used to its full advantage is the lack of utility in public contract projects. The advantages are evident from the anecdotal comments of research respondents. A6, for example, states *"mediation is good in solving disputes in Saudi construction projects, and it is the best of all in my perspective, but it is being rarely used. It may take about a month to resolve problems and that is one of its best characteristics.*' A12 argues *"at the moment we need some method other than litigation to solve disputes, such as mediation which is characterised with flexibility, less cost and most importantly, a shorter timescale. Mediation always takes less time.*' A4 agrees, but suggests it is less used than it should be because of perceptions that there is a "*lack of arbitrators and experts' knowledge about this method and its benefits*.' In the context of Saudi Arabia, interviewee A3 adds "*mediation is a good method and with flexibility but is hardly used and that is because of lack of support from Ministry of Justice for its use*."

- **Dispute Adjudication Board (DAB)**

The use of the Dispute Adjudication Board (DAB) as method of alternative dispute resolution is not currently used to its full potential in Saudi construction projects, although eight of the research participants believe it has many potential advantages in this arena. A12, an arbitrator, describes how it would operate; "*based on the experiences I had in Saudi Arabia, where I was member of the board and I was involved in this method of handling disputes and from the outset of a project, the dispute arbitration board starts to play its role. The number of its panel members for the hearing of a dispute is uneven, to avoid stalemate. It helps avoid halting a project because all of the disputes will immediately be handled on the site*." Interviewee Ac1 stresses speed and flexibility and perhaps the most important positive point of this method is its conduct on site and consequent awareness of dispute details; necessary documentation is also within the dispute arbitration board's reach. The Dispute Arbitration Board has a considerable impact in the quick resolution of problems, but is not currently used effectively in Saudi Arabia.

- **Arbitration**

Arbitration is only used to any significant extent in private sector of Saudi construction projects. Interviewee A11 comments "*arbitration is a method that is only used in private sector as the system applied by the government does not allow any other methods but litigation to be used for solving disputes in SCP. As a result, no one generally refers to arbitration to resolve a*

dispute unless they are semi-state companies or experienced companies or businessmen. Sometimes it is used to save reputation of the business involved in the dispute, a cultural issue to many prominent businessmen who value social status." Interviewee E5 admires the arbitration method and says: "*arbitration is an effective method in solving disputes in SCP and is better than litigation. It is less expensive than litigation, and also it takes less time than litigation does. In most of the cases it will not take more than six months*.' Not all respondents were so effusive in their admiration.

E8 is more critical of arbitration; he complains of high cost to private business, potentially more so than litigation, the cost of which is largely borne by the state. As a relatively formal process compared to other methods of ADR it can be a lengthy process. E15 agrees; "*arbitration is within the framework of official litigation and we prefer those alternatives with more flexibility which are far away from being officially imposed and highly expensive measures, which involve longer procedures for both sides of dispute*". The time taken by the arbitration process is commented upon by A3; "*time is considered as negative point of arbitration since it takes a long time to resolve a dispute in SCP. I should remind you that I took part in arbitration for a case that took three years and this is not shorter than the time litigation takes to resolve a construction project dispute*." Interviewee A4 asserts that "*one of characteristics of the arbitration method is that it is based on obligation with no executive power. After arbitration has concluded, litigation is still likely to be involved and, due to some prohibition in a country, for example, usury, the judge may reject what has been concluded during the arbitration process. Some domestic or international companies therefore pursue their case to the Gulf Arbitration Centre in Bahrain, or to the Paris Bureau, or Arbitration Centre in London".*

Interviewee A9 casts doubt on the character of the arbitration process, asserting "*arbitrators should be impartial and fair towards the disputes, but they tend to turn into a lawyer for advice, especially when three or five arbitrators are involved. This is why many companies avoid arbitration and lean towards lawyers since the duty of lawyer is clearly known and the financial expenses are clear from the outset, whereas there is little clarity about arbitrator's wages."* On the broader issue of cost, interviewee E10 states: "*Arbitration is a costly method, compared to others. It is not easy to take part in it due to the expenses which will be incurred.*' He adds that there can be a religious or faith element to adjudications, pointing out *'if someone lacks any legal or religious background, he will not be able to occupy a position as an arbitrator; he will only act as an expert and his duty will be limited to expertise reporting, without being allowed to do arbitrating, or take part in a dispute resolution. In my opinion, an expert engineer with*

long years of experience who has taken part in solving disputes has the ability to take part in any engineering disputes".

The arbitrator (A4) said: There is a live practical example to solve disputes resolution, in terms of construction project needs in Saudi Arabia. A contractor who possesses a big company issued some complaints to an owner. This project consisted of residential buildings with 450 residential units, worth 120 million Saudi Riyal (SAR). The duration of the project was 450 days and the amount claimed by the contractor was 30 million Saudi Riyal (SAR) from the owner. The causes of dispute were numerous and are listed as follows:

First cause: The owner requested the contractor install extra exit doors for each unit, giving an average of 450 exit doors.

Second cause: The owner requested the contractor to change the water heater, which was not specified in the original contract.

Third cause: There was a difference in the real area of the buildings' basement as it was 120 m2 in whilst the design stipulated that it was 140 m2 in real.

Fourth cause: The contractor asked the owner to extend the time duration for the project, because the owner and consultant delayed approving the materials to be used for the project, and so this impacted on the project timing.

Fifth cause: The change of consultant during the project by the owner had an impact on the overall timing of the project.

Sixth cause: A delay by the owner in the time take to provide the contractor with the locations, as there were three separate locations.

Seventh cause: The differences on the level of the locations with what was specified in the design, as some of the locations were wasteland belonging to the municipality, and so therefore this required extra work from the contractor to level the ground properly.

In return, the owner had some claims from the contractor, and these were as follows:

First claim: He requested for the implementation of a 10% penalty for delaying compensation based on the contract. Second claim: He requested the cost for transferring the remaining project

for the rubbish left behind from the contractor, as the owner claims that he hired a subcontractor to accomplish the outstanding work.

Resolving these type of causes of dispute were accomplished through the arbitration method and the final verdict was as follows: These claims and disputes stopped the project for a whole year, and then the disputes were resolved through the arbitration method, which resulted in a ruling in favour of the contractor for the sum of nine millions Saudi riyals (SAR), while the ruling in favour of the owner was for 12 million Saudi riyals (SAR), and a fine for 10% of the contract value.

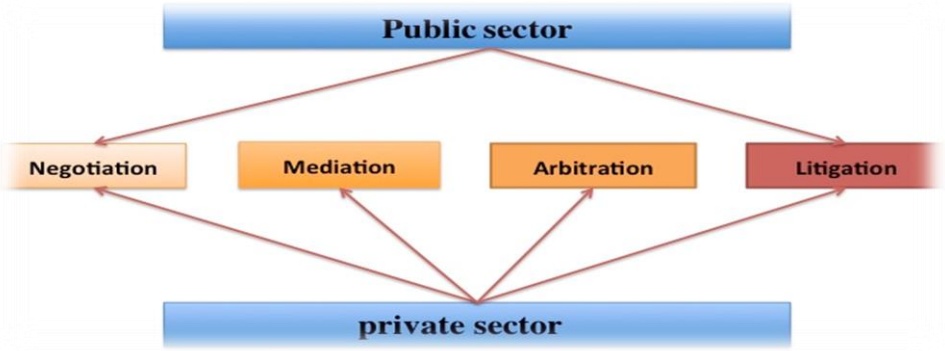


Figure 5-6 : Method of Dispute resolution in Saudi Construction Project

Given that litigation is a means of dispute resolution in Saudi construction projects in both the public and private sector it is the dominant method used by parties in disagreement, especially because most of the large construction projects in the KSA are government sponsored. Simple negotiating is used rarely in both sectors according to research respondents, and mediation used rarely in the private sector, arguably because common practice in dispute resolution is to turn to the traditional court litigation. Arbitration on domestic Saudi based contract disputes is not used in the public sector. Negotiation, mediation, and DAB have clear advantages in terms of speed of resolution and cost which prevent more than necessary disruption to the construction progress; the respondents tended to agree on the characteristics of cost effectiveness, flexibility and time. There was some discrepancy in responses on the time and cost issues of arbitration, with profoundly divergent opinions on expense and length of proceedings reflecting respondents own experiences rather than, perhaps, theoretical perceptions.

5.6 Critical Success Factors for ADR in Saudi Construction Project

Academics, arbitrators and experts are asked about the Critical Success Factors for ADR in the resolution of disputes in Saudi Construction Project. The factors identified by interviewees as

of significant benefit from the ADR process were numerous; speed, economic, flexibility in procedure and decision-making, confidence in the process, neutrality, fairness, maintenance of relationships, privacy and confidentiality of nature of the dispute, preservation of reputation and the non-adversarial nature. A3, E14, A12, A7, A11 and E14 highlighted speed, economic savings, flexibility and confidence are the most important factors for alternative disputes resolution in Saudi Construction Project. They were particularly impressed with the fact that some of the processes would be complete in a month rather than the three-year estimate for litigation.

Anecdotally, A12 asserted '*if some of these methods are not free of charge, they are very cheap and often do not require you to be located in the same city where the dispute is taking place*.' A11 stressed the importance of confidentiality as *'an important characteristic of these mechanisms by contrast with litigation which is dealt with openly in public*.' The Respondents concurred on issues such as time and cost savings, as well as neutrality and fairness in negotiation and mediation. Interviewee A4 added "*in ADR all the good characteristics are there: cheap in cost and less time involved; in some cases it is matter of a few hours*", highlighting the 'fairness' critical success factor as a positive comparison to litigation. E10 and Ac6 concur.

Much anecdotal evidence evolved from the interviews. Respondents E5 and A11 believe the preservation of public and business reputations is an important factor in the maintenance of relationships, and therefore stress the benefits of privacy and confidentiality of ADR. E5 stated that '*in a meeting when a dispute is being resolved, you may feel that there is a psychological pressure to appear reasonable."* E6 adds that trust is a major factor which affects the time and cost invested in resolution. E8 asserts the *"non-adversarial nature and confidence in the result are important factors for ADR in Saudi construction projects. When someone has experience of a particular form of ADR, he will feel the confidence that it works properly and fairly."* A11 and A9 believe that reputation of the process and its non-adversarial nature are important factors, in addition to flexibility, time and cost in Saudi construction projects.

5.7 Barriers to using ADR in Saudi Construction Project

The study sought opinions on what barriers prevented the use of alternative dispute resolution in Saudi construction project problems, and responses were classified into the following; (i) contractual disputes barriers, (ii) governmental barriers, (iii) cultural barriers and (iv) development and rehabilitation barriers

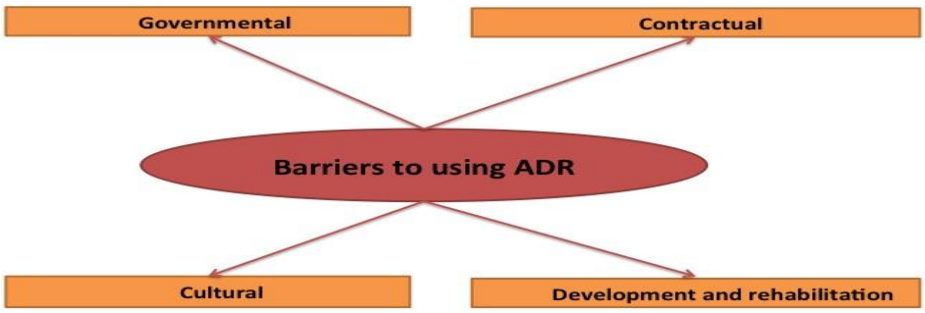


Figure 5-7 **:** *Barriers to using ADR in* Saudi Construction Project

5.7.1 Contractual dispute barriers

Contracts themselves may prohibit the use of ADR in Saudi construction projects. The answers elicited from the respondents show clearly that absence of a clause in the contract of Public Works allows the use of alternative dispute resolution in construction projects, otherwise parties are required to use the litigation process. Public Work Contracts (PWCs) are those used by government to which it is a party, and they will generally exclude the resort to ADR. All of the arbitrators and experts were critical of the lack of utility of ADR processes. The solution to disputes is only sought through litigation. A9 comments that PWCs lack any flexibility in case of dispute as the both parties are referred to litigation, and that is not a good method of preservation of a good relationship between the different parties to a project. It can even bring it to a halt. Due to developments in construction projects and an increase in foreign involvement in construction projects, it is essential that contracts incorporate independent ADR procedures to offset what A11 calls '*an old contract known for its failure in handling disputes.'*

Ac1 states that "*the main barrier that prevents the use of ADR is absence of a clause in the contract of Public Works which allows the use of alternative dispute resolution in construction projects such as those involving the International Federation of Consulting Engineers (FIDIC)*' now a common standard of party dealings in major industrial contracts. Most importantly, the FIDIC created an international contract, relatively simple and understandable for most people and parties involved, and easy to insert or delete clauses to suit the contract and the state involved. In Saudi Arabia, it has been tested in quasi-governmental companies such as Aramco. The contract may include a format of ADR attractive to the parties and the state.

Nevertheless, A6 disagrees with its use, considering it as not being suitable for the Saudi culture and government and that just because it is successful in other countries does not mean it will be necessarily successful in the Kingdom. A7, E13 and A4 asserts that '*we need a unified contract to be newly prepared in order to be used by government*' and indeed in all Saudi construction

projects. A7 adds that "*such contracts will suit this country which has a religious background. It should have specifications appropriate to the Faith and it should take into account developments in construction, given that many of the new contracts are with foreign companies in privates sector*.' Interviewee E13 experts *"regrettably we are limited to select the common PWC because there is no alternative but litigation for solving disputes and since some of contracts are available to the private sector, some of which are unprofessionally prepared, possibly consist of a single piece of paper, and maybe does not ensure both sides' rights. Simply, FIDIC does not suit our culture*". A4 advises of the need to have *'a unified state contract that matches with developments and relations between public and private sectors and to be prepared by some of those ministries that are involved in this matter.'*

5.7.2 Government barriers

The Saudi government is evidently not enthusiastic about ADR as a method of resolving construction project disputes, preferring to use the national court litigation process. This is changing due to the influx of international contractors and expertise, but all research respondents noted state reluctance, E10 commenting "*the lack of officially implementing of ADR by government on disputes is one of main barriers that prevents it being used, and when there is no obligatory statement issued by the government to all ministries and institutions to submit to ADR, the rest of barriers are unimportant*." E8 argues '*it is necessary to impose the alternative dispute resolution in Saudi Arabia to keep up with international progress*.'

5.7.3 Cultural Barriers

This problem has been mentioned by respondents in other barrier contexts, and responses are classified into (i) adversary culture, (ii) lack of awareness of the processes, (iii) lack of knowledge or education on implementing ADR by project management and legal departments, (iv) lack of knowledge on the part of judges and lawyers in dealing with ADR, as advanced by A3 and E13; (v) lack of trust in the processes and (vi) lack of awareness of costs factors. E13 was most concerned that "many of the Judges have no idea about ADR", A12 and E10 that the "adversary culture is a constant barrier" and A11 and E5 see that lack of management and legal knowledge as cultural barriers.

Anecdotally, A15 explained "*the method of handling a dispute for each nation is different and some do not have any problems with litigation. Others deal with unpleasant disputes which can be found in every possible shape and would prefer to take the simplest disputes in SCE to litigation, instead of handling it by means of resolving mechanisms.*' A4, E8 and A11 agreed

"*we see that the culture of litigation is a fundamental matter for us and litigation is the very first stage that we prefer to take in any case*." A6 stated that "*lack of trust on ADR for solving disputes is a barrier that prevents its use in disputes between parties; whether they are owner, consultant or contractor, they have doubts about using it due to the lack of trust."* Interviewees A4 and E10 concurred.

Lack of knowledge price of ADR is deemed by respondents as a cultural barrier, perhaps because of the inclination to consider litigation as a first resort. A6 said "*the knowledge of people in Saudi Arabia should be elevated in terms of using the cost benefits of ADR, since lack of knowledge is an impartible part of a cultural barrier."* E10 added: "*In terms of lack of knowledge of price of ADR, we are one of those nations that always lacks in understanding newly achieved science*." The other interviewees agreed with this assessment of cost cultural barriers, although A7 noted the lack of stability in the process itself as far as cost was concerned, which could often depend on the expertise of the arbitrator.

5.7.4 Development and Rehabilitation Barriers

Three such barriers to the use of ADR were identified from the respondents; (i) lack of an establishing engineering arbitration centre and ADR for solving disputes, (ii) lack of adequate experiences of arbitrators and (iii) lack of experts and education in the resolution process as applied to construction projects. E10 stresses the absence of an "*established engineering arbitration centre is the biggest barrier for development and rehabilitation that is preventing use of ADR. There should be at least some centres related to this issue in the Kingdom. Many construction and engineering disputes are taken abroad, whether to the arbitration centre in Bahrain, or the parties refer to Paris or London to resolve the dispute*." A4 added '*the largest companies working here are SABIC and ARAMCO and when disputes arise, they refer to abroad and that is counted as a negative point and that can lead to losses by our companies.*'

Interviewee A7 believed that lack of experienced arbitrators and experts is a major barrier for development and rehabilitation through ADR since '*some of the arbitrators and experts get involved in disputes for which they have inadequate experience. There can be some issues that cannot easily be noticed by inexperienced experts*.' Interviewee A4 concurs; "*there is no training in various stages for graduated engineers and law school students and there should be some subjects that educate about the ADR*."

In Saudi Arabia, ADR is slowly becoming a dispute resolution option, but much progress needs to be made, especially as the rate of construction in the Kingdom grows an international

contractors become more integrally involved in development of the infrastructure. Much is to be learned, however, to remove the barriers identified by the research respondents to improve effectiveness and quality of the project and ensure a smoother method of working and the maintenance of trust.

5.8 Summary

This chapter has considered, with the considerable assistance of experts in the field of Saudi construction projects, the status and value of ADR as an alternative to litigation in the resolution of commercial disputes in the Kingdom. There are evident differences in the classification of the nature of disputes, and the factors which govern the success of resolution. These are essential to ensure the efficacy of the projects and their effective completion. There needs to be a considerable improvement in the awareness and knowledge of dispute resolution processes to ensure speed and value, simply because budgets are not non-exhaustive.

Disputes in Saudi construction projects have obvious impacts on time, cost and quality, which have to be properly managed to avoid costly delay. Business, legal and site management have to be improved to ensure contracts are properly prepared and negotiated, so that each party knows their role and duties. Each must know how to deal with the legal and practical aspects of project operation from the boardroom planning to on site performance. Thus, it has been noted that it will not only require a change in business practices, but in cultural adaptation.

Chapter 6. Quantitative: Data Analysis

6.1 Introduction

This section includes the quantitative analysis of the data collected for the PhD phase. The aim is to achieve the objectives of research, whereby it is hoped the questionnaire will fill all the gaps in the literature. The questionnaire was distributed to arbitrators, experts and engineers in the public and private construction sector in KSA. The sample size for this phase of the data collection process was 900, with 327 responses being received from participants. To calculate the total response rate for this phase, the researcher has used a formula from calculator.net/sample-size-calculator, which has a confidence level of 95%. The questionnaire was designed and distributed using Survey Monkey, and the analysis of the questionnaire was performed using figures and tables.

The first section explains participants' general information. The second section analyses the impact of dispute on time, cost and quality in Saudi Construction Project. The third section investigates the types and causes of disputes in Saudi Construction Project. The fourth section explores the method of disputes in Saudi construction projects. The fifth section ranks and analyses the critical success factors for Alternative dispute resolution, and the sixth section ranks and analyses the barriers of using Alternative dispute resolution in Saudi Construction Project. Finally, it will study the relationship and comparison between the types causes of disputes and methods of dispute resolution.

6.2 Survey participants

The questionnaire was distributed to the participants by the officials from the assimilating centre of the SCE, which stores personal information, such as email addresses and mobile phone numbers, within eight weeks. The participants included: academics, arbitrators, experts and engineers who were officially registered in the SCE. The questionnaire (see appendix 3) was given to them. As many as 327 filled in the questionnaire. The process went through three different stages. During the first stage, the questionnaire was distributed. In the second and the third stages, the questionnaire was filled in. Its importance for the organisation was introduced to the participants. The questionnaire consisted of seven sections. The first section dealt with the participants' general information. The second was about that impact disputes have upon time, cost and quality. The third section dealt with the

types and cause of disputes. The fourth tackled methods of dispute resolution in Saudi construction projects. The fifth was about critical success factors for ADR. The sixth was about barriers to the use of ADR in Saudi construction project. The seventh and final section was concerned with comparing between types of disputes with DRM.

6.3 Participants' general information

There were many participant engineers in SCE in Saudi Construction project and among them were both Saudis and non-Saudis. Therefore, the researcher did not want to ignore this point as an important additional issue in this section, and various ideas are introduced due to the variety of nationalities. This gives a positive aspect to this section.

The aim of this section was to determine the Saudi and non-Saudi participants in SCP and to get to know them. Some of the questions forwarded in this section illustrate the value in a comparative way between Saudi and non-Saudi.

The figure 6.1 that the proportion of Saudi to non-Saudi participants was similar, with 56% Saudi and 43 % non-Saudi. Therefore, the difference between the number of Saudi national and non-Saudi nationals is small.

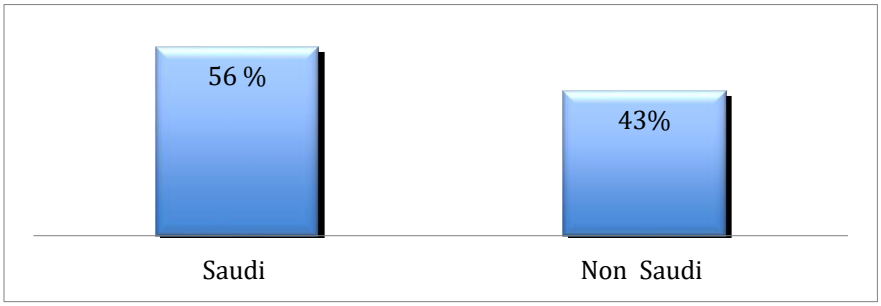


Figure 6-1: Participants' nationality

Generally speaking, it clear that far more participants had been involved in Saudi construction projects disputes than had not. The proportion of those who had been involved in disputes was over 90%.

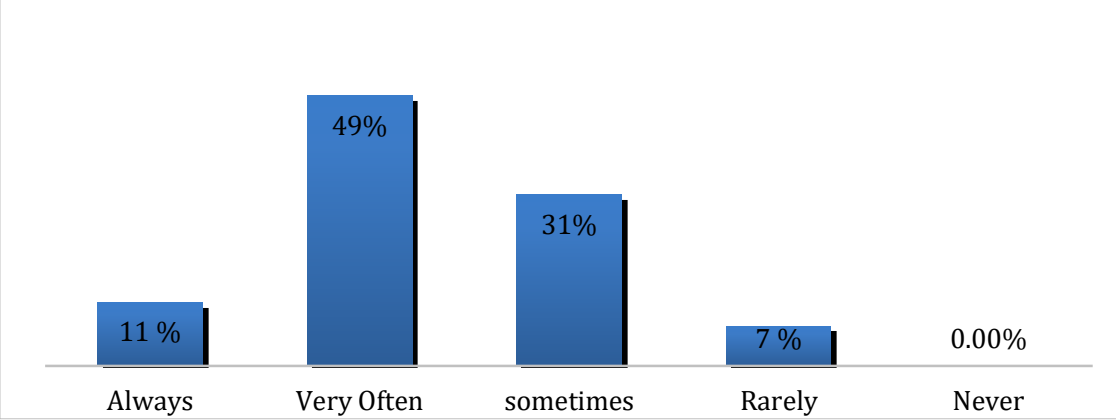


Figure 6-2: Disputes that face participants in Saudi construction projects.

The aim of this section was to establish who knew about causes of disputes in Saudi construction projects. The questions asked in this section are related only to those who were involved in disputes in Saudi construction projects. From figure 6.2, it is clear that the majority of participants, 49%, said they had been confronted with disputes. There was also the group who sometimes came across disputes: they constituted 31% of the sample. Those who had rarely come across disputes were fewer in number than those who were sometimes confronted with disputes: the proportion of this group was 7%, Furthermore, the proportion of those who always confronted disputes was 11% which was more than the proportion of those who had never confronted disputes and less than those who were generally or sometimes confronted with disputes, which stood at only zero. This was the smallest participant of those who were confronted with disputes.

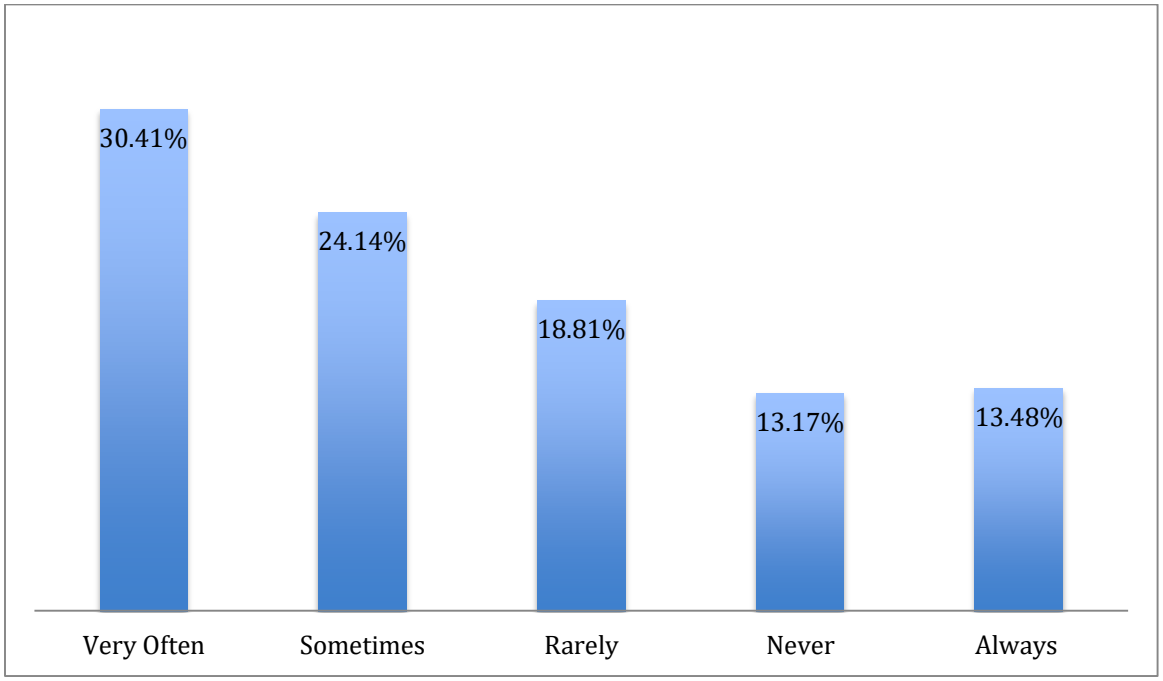


Figure 6-3: Frequency of disputes' resolution in Saudi Construction Project

The participants in the interview were asked about their participation in resolving disputes. The proportion of those who participated in disputes' solution, compared with those who did not take part, was high. The figures showed 85% in the former group and 15% in the latter. The aim of this section was to identify those who got involved in dispute resolution in Saudi construction projects. Some of the questions used in this section related only to those who participated in dispute resolution in Saudi construction projects.

Figure 6.3 illustrates that the highest proportion refers to those who "very often" participated in disputes' resolution, the figure being 30%. Next was those who "sometimes" participated in dispute resolution, standing at 24%. Following that was the proportion of those who "rarely" participated in dispute resolution. After that came those who "always" participated in dispute resolution. At the end came those who "never" participated in dispute solution, accounting for 13%.

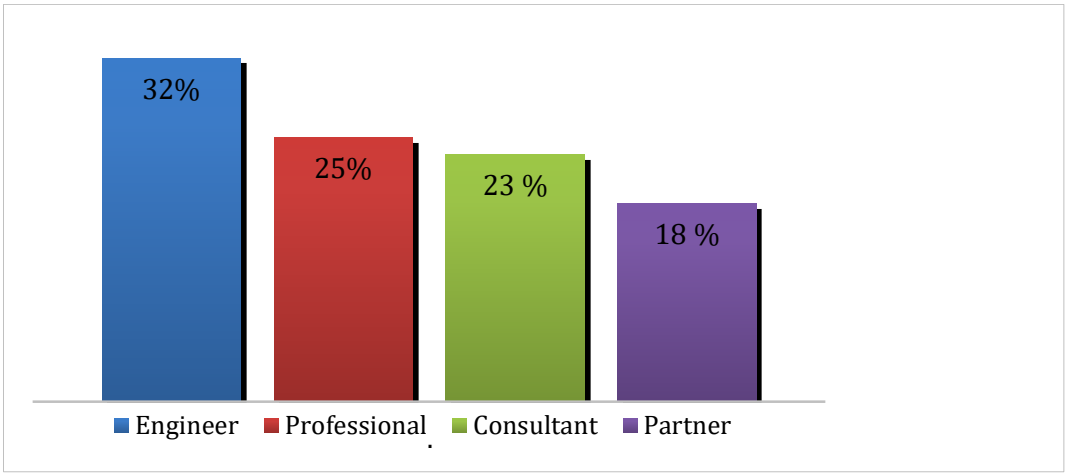


Figure 6-4: Classification of participants according to Saudi Construction Project

Participants in the interview were asked which category they fell into. The figure illustrates that those in the "engineering" category compared to "partner", "professional" and "consultant" were the highest, accounting for 32%. The aim of this question was to make sure that participants from the SCE of all categories were registered and approved in SCE and to confirm their desire to participate. Figure 6.4 illustrates that categorising the member of the SCE based on engineering applications is as follows: engineer, partner, professional and consultant. The highest figure of participation in the questionnaire belonged to "engineer", standing at 32 %. The next was "professional," at 25%, Followed by "consultant" at 23%. The lowest figure belonged to "partner," representing just 18 %.

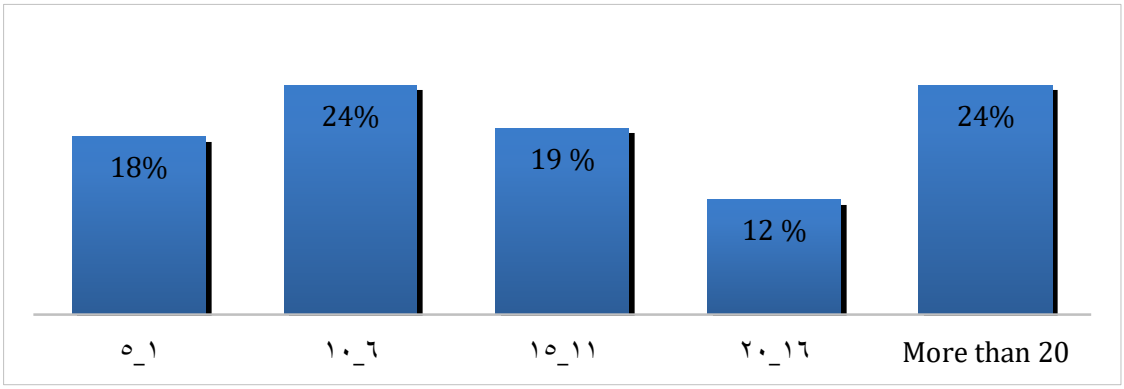


Figure 6-5: Participants' experience in Saudi Construction Project

The years of experiences in the SCE was classified into five different categories, from 1-5, 6-10, 11-15, 16-20 and 20 onwards.

We realised that participants with over 20 years as well as those with 6-10 years of experience were the largest groups participating in the questionnaire, with each group accounting for 24 %. The unexpected point was that they were equal in number, with the two groups covering the half of the years of experience of all of the participants combined.

The aim of this section was to determine the years of experience of participants from the SCE. Figure 6.5 illustrates that the number of participants varied. The smallest figure belonged to those with 16-20 years of experience, standing at 12 %, while those with 1-5 and 11-15 years of experiences were greater in number, at 18% and 19% respectively. We can see that those groups with over 20 years and 6-10 years of experience were the largest groups participating in the questionnaire.

When it comes to allocating expertise, the participating engineers from the SCE varied in terms of qualifications. So, based on previous analytical study, the engineers are categorised according to their expertise. The highest proportion were represented by civil engineers while other proportions covering the rest of engineers were nearly the same and the proportion of participants of other than civil engineers combined was 61%.

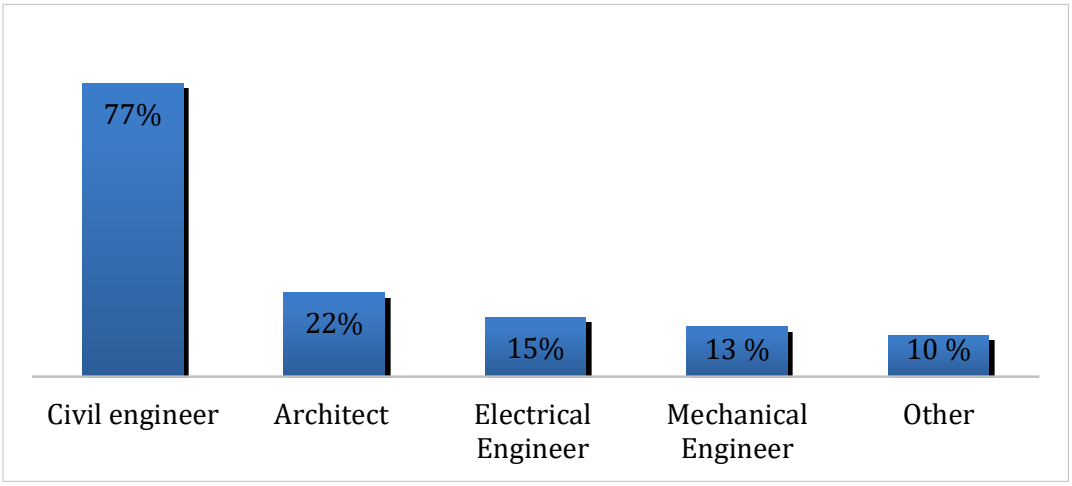


Figure 6-6: Classification of participants according to bachelor degree

Figure 6.6 illustrates that civil engineers represented 77%, a figure higher than the other expertise and the variance was high. “Architects” stood at 22%, followed by “electrical engineer” at 15%, “mechanical engineer” at 13%, and “other” engineers with the lowest proportion, standing at 10%.

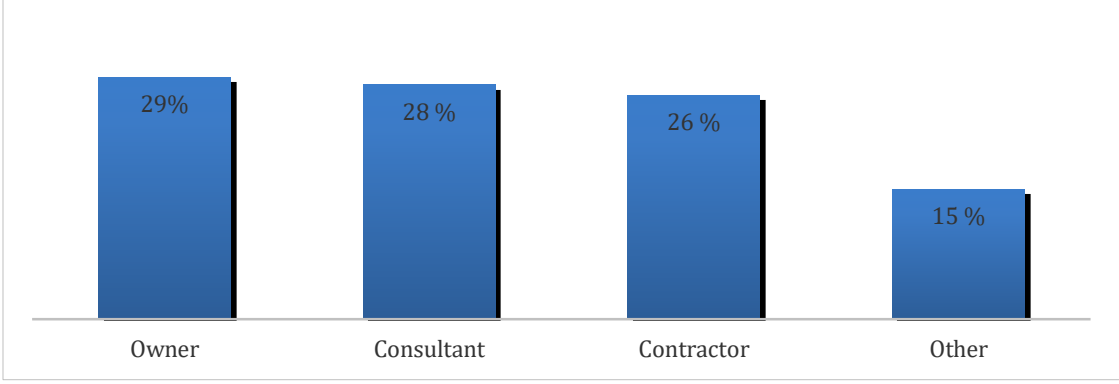


Figure 6-7: Percentage which describes organisations

Participants in Saudi construction projects were divided into four categories based on the nature of the occupation: "owner", "consultant", "contractor" and "other" such as owner representative, sub-contractor or supplier.

It is illustrated that the proportion of the major parties in projects was almost equal for "owner", "consultant" and "contractor", accounting for one third of the total, with "owner" with 29% ranking highest, while the "contractor" stands lowest at 26%. The aim of this section was to determine the nature of the occupations of engineers participating in the saudi construction projects.

Figure 6.7 illustrates that the highest proportion of participants is 29%, which belongs to "owner." Next, we have "consultant" with 28%. The proportions for owner, consultant and contractor are close to each other, while the proportion of "other" participants is the smallest at 15%.

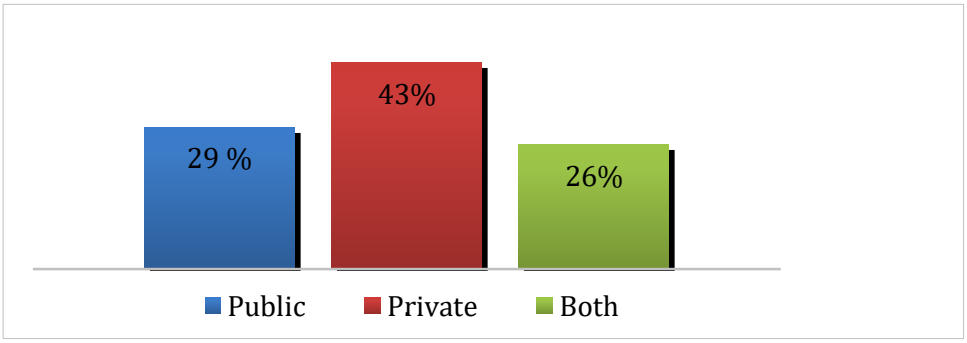


Figure 6-8: Percentage of participantss sectors in saudi construction projects

The participants in Saudi construction projects were employed in public and private sectors, with some of them employed in both sectors at the same time. The participants from the

private sector represented nearly half of the total participants, with the proportion for this is higher in comparison with public sector and with the sector consisting of private and public" both", which is 43%, while those who are engaged in both sectors have a lower proportion of 26%.

The aim of this section was to determine the sectors that the participant engineers in the saudi construction projects came from. Figure 6.8 illustrates that the proportion of the participants varies. It also illustrates that the number of participants from private sectors was higher, standing at 43%, while the numbers of participants in the public sector and in both sectors were lower, at 29% and 26% respectively.

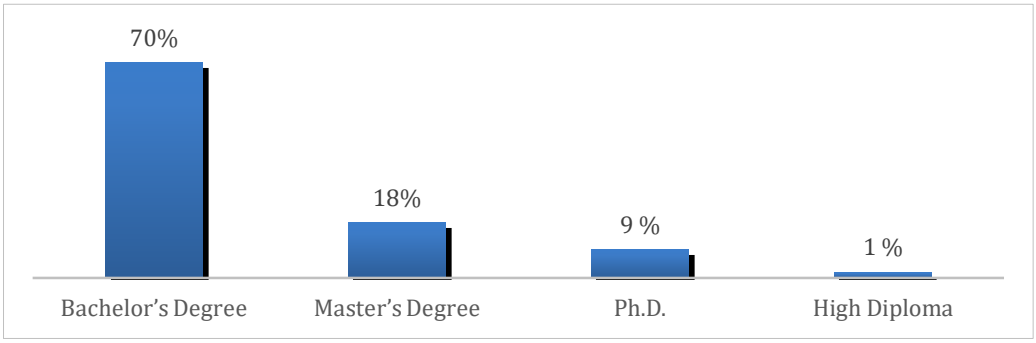


Figure 6-9: Percentage of participants according to educational level in SCE

We learn that the participants' qualifications in SCE consisted of are of four levels: "bachelor's degree", "master's degree", "Ph.D." and "higher diploma." Those qualified with bachelor's degrees made up the highest proportion, at 70%, while the proportion of those with other qualifications combined did not exceed 29%. The aim of this section was to determine the qualification level of engineers participating in the saudi construction projects from the SCE.

Figure 6.9 illustrates that the participants possessing bachelor's degrees represented the largest proportion, at 70 %, as shown in the figure. Other participants with master's degrees, PhD sand higher diplomas stood at 18%, 9% and 1% respectively. From this, we learn that those with higher qualifications were far fewer in number than those with bachelor's degrees.

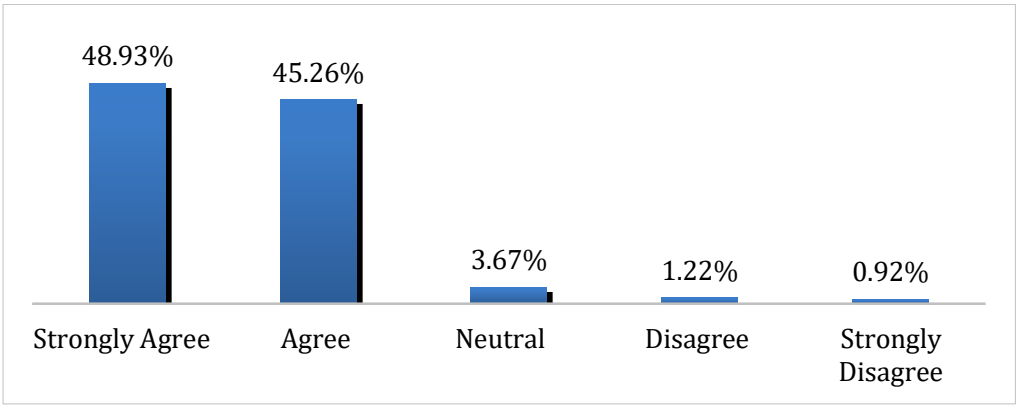


Figure 6-10: Percentage of disputes dangers in saudi construction projects

The participants were questioned about the dangers of disputes in the saudi construction projects. The answers were divided into 5 categories: "strongly agree", "agree", "neutral", "disagree" and "strongly disagree". The proportion of "strongly agree" and "agree" was 94.19% combined. This was a very high proportion compared with those of "disagree" and "strongly disagree" combined, which was only 2.14%.

The aim of this section was to determine the level of dispute dangers from the participants' point of view. These participants were from the saudi construction projects.

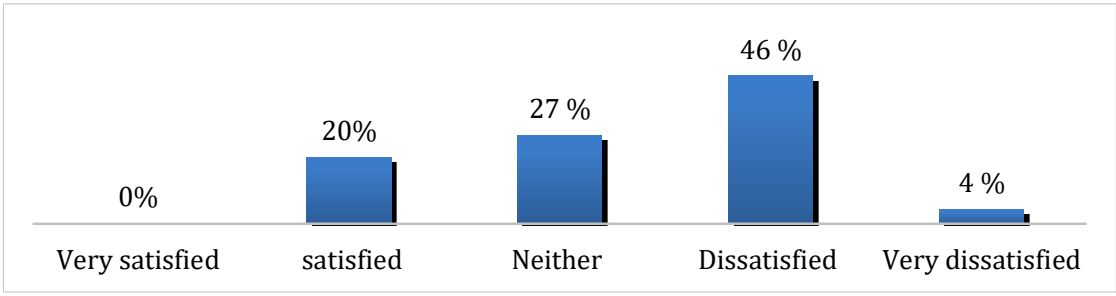


Figure 6-11: Percentage of participants' satisfied with method of dispute resolution in Saudi Construction Project

Figure 6.10 illustrate that participants in the "strongly agree" made up the highest proportion at 48%, closely followed by "agree", at 45%, while very few fell into the categories of "neutral", "disagree" and "strongly disagree" in comparison.

The participants were asked about their satisfaction with the method of dispute resolution in the Saudi Construction Project. The participants were classified as "very satisfied", "satisfied", "neutral", "dissatisfied" and "very dissatisfied". It can be observed that 50%

were either dissatisfied or very dissatisfied. This figure represents over half of participants in Saudi construction projects. It can also be seen that, in terms of dispute resolution, those who were "very satisfied" or "satisfied" have a combined total of just 20 %. The aim of this section was to determine the level of satisfaction with dispute resolution among the participants in the Saudi Construction Project.

Figure 6.11 illustrates that, in terms of dispute solution, the proportion of those who were "very satisfied" was close to 0 %, with those who were "satisfied" at 20 %. Those who were "neutral" about the method of dispute resolution were more numerous than those who were "satisfied." Their proportion was 27%. Next to them stands the higher proportion of those who were "dissatisfied." It is 46%. Those who were "very dissatisfied" were small in number compared to those who were "satisfied." Those who were "very dissatisfied" proportion was 4%.

6.4 The impact of dispute upon time, cost and quality

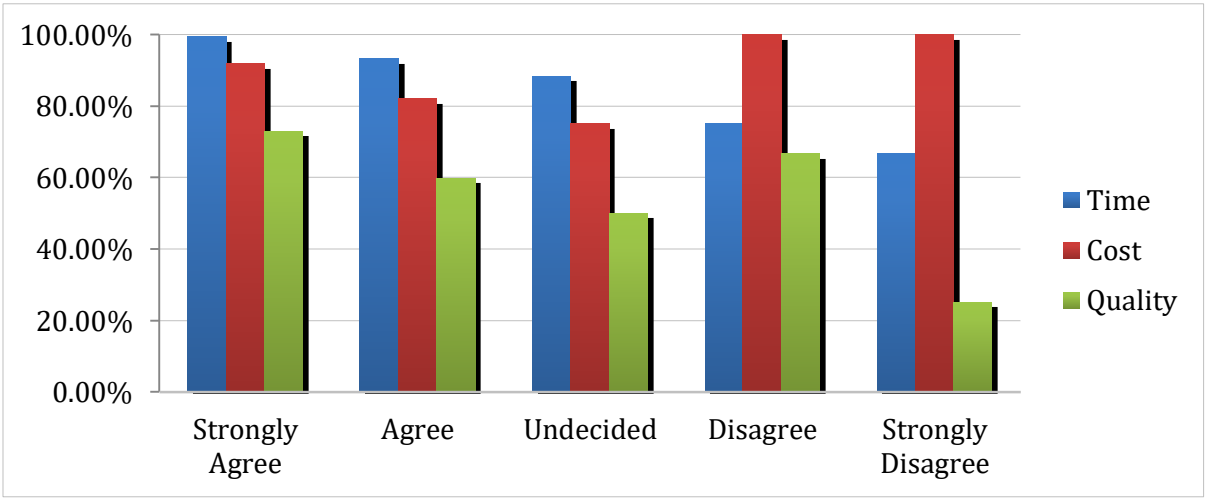


Figure 6-12: Comparing the danger of disputes and the impact of disputes on time, cost and quality

In this section, a comparison between two questions was conducted. In the first question, the participants were asked about the dangers of disputes in the Saudi Construction Project. In the second, they were asked about their point of view in regard to the impact of disputes on time, cost and quality. It became clear that the impact of disputes on cost and time were considered high by participants, while the impact on quality was considered very little. For

those in the category of "strongly agree" and "agree" with regards to dangers of disputes, the impact of disputes on time was found to be high, at 99.38% and 93.24% respectively.

Of participants who "disagree" that disputes have "very dangerous" and "dangerous" impact of disputes on cost the figure was very high, at 100%. The figure illustrated those who "disagree" about disputes' high level of danger and the impact of disputes on costs is very high, it is 100%.

Figure 6.12 illustrates that in the view of those who selected "disagree" or "strongly agree" for dangers of disputes, the impact of disputes on costs was as high as %100, with the impact of disputes on time ranked second. The figures were 75% and 66 % respectively. Quality has the lowest figures, at 66 % and 25 % respectively.

Those who selected "strongly agree", "agree" or "neutral" in terms of dangers of disputes, considered the impact of disputes on "time" to be very high, with figures of 99% and 88% respectively. The figure for impact of disputes on "cost" came in second position, the figure for "strongly agree" at 91%, "agree" at 82% and "neutral" at 75%. "Quality" stands in third place with the figure for "strongly agree" being 72%, that of "agree" being 72% and that of "neutral" being 50%.

6.5 Types of Disputes' causes in Saudi Construction Project

The causes of disputes were classified as Financial, contractual, owner, design, and people's behaviour, contractor, project-related and external. Those who had not encountered any disputes were set aside, and those who had encountered disputes cover over 90 % of the total compared to those who had not, which stood at only 10%.

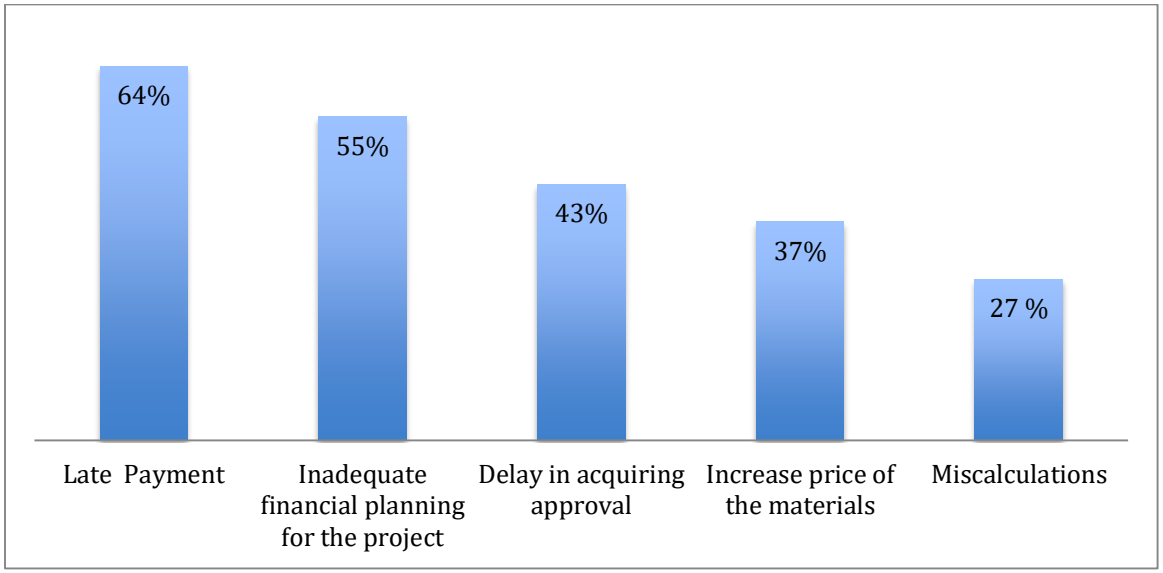


Figure 6-13: Percentage of causes of disputes in Saudi construction projects (financial issues)

Participants were questioned about the causes of financial disputes in Saudi construction projects and it became clear that the causes of financial disputes were in five categories, as follows: "Late payment", "inadequate financial planning for the project", "delay in acquiring approval", "increased price of the materials" and "Miscalculations". The most common cause of financial disputes was "late payment", at 64 %. The lowest figure was for "Miscalculations" with a proportion of 27 %.

Figure 6.13 illustrates that the most cause of financial disputes was "late payment" according to participants, standing at 64%. "Inadequate financial planning for the project", came in second position with a figure of 55%. Next came "delay in acquiring approval" with a figure of 43%. Next was "increased price of materials" with a figure of 37%. Finally we see that the least common cause disputes according to participants was "Miscalculations" at 27%.

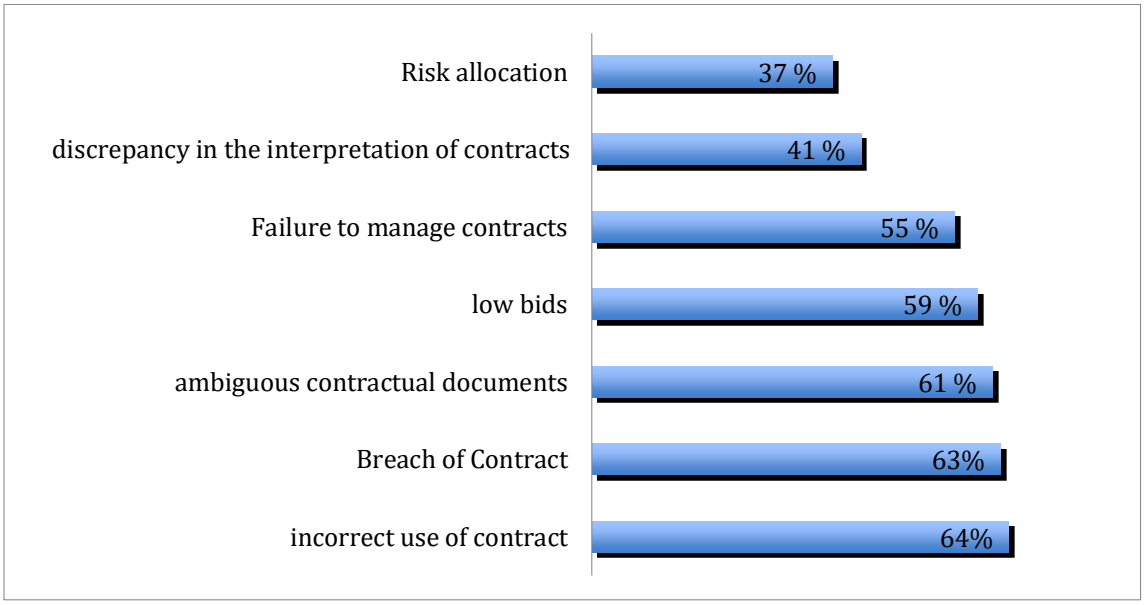


Figure 6-14: Percentage of causes of disputes (contractual issues)

The participants were questioned about the causes of disputes over contractual issues. It was found that the causes of disputes over contractual issues could be divided into seven categories as follows: ambiguous contractual documents, breach of contract, incorrect use of contract, low bids, failure to manage contracts, discrepancy in the interpretation of contracts and risk allocation.

This is a large number of categories, compared with other causes of disputes. This shows that the proportions of different causes of disputes in contractual disputes, are similar. It becomes clear that the highest proportion for a cause of dispute in contractual issue belongs to “use of contracts incorrectly” at 64%, while “risk allocation”, had the lowest proportion at 37%.

Figure 6.14 illustrates that the most common cause of disputes in contractual projects was “incorrect use of contracts”, at 64%. Next was “breach of contract” at 63%. This was followed by “the absence of the contract content” at 61%. The proportion of the following causes of disputes, gradually drop as follows: “Low bid”, 59% “failure to manage contracts”, 55%, “discrepancy in the interpretation of contracts”, 41% “risk allocation”, 37%. It can be seen that the smallest proportion belongs to the cause of dispute in contractual issue, which is termed “risk allocation” standing at 37%.

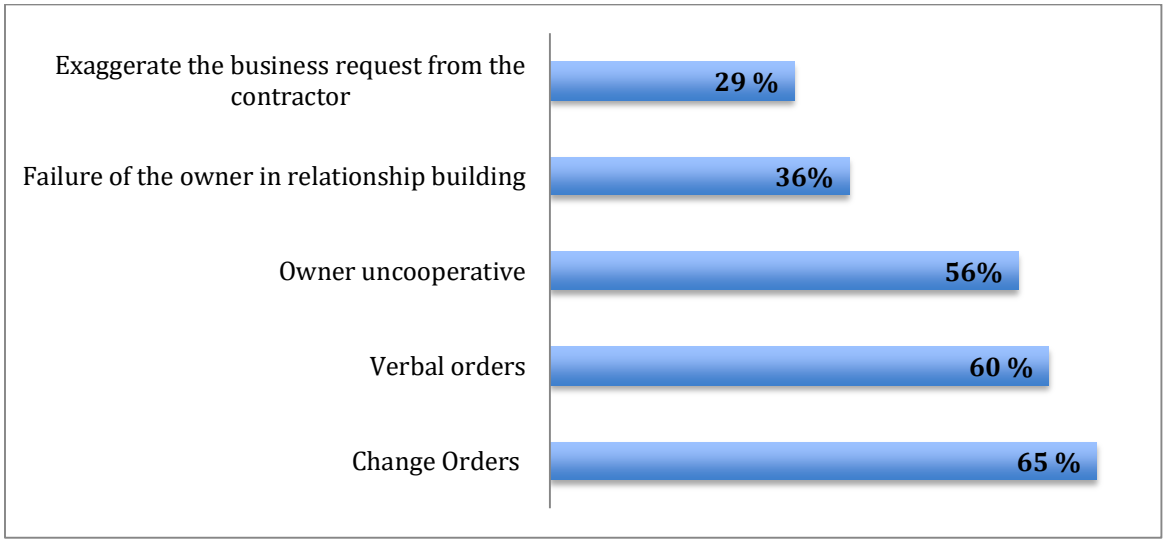


Figure 6-15: Percentage of causes of disputes (owner)

Participants were asked about the "owner" being the cause of disputes and it was found that the causes of disputes in "owner" issues could be divided into 5 categories as follows: Change orders, verbal orders, owner uncooperative, failure of the owner in relationship building, and exaggerate the business request from the contractor. "Change Orders" was the most common cause of dispute in "owner &" issues, at 65%, while the least common being "exaggerate the business request from the contractor" at 29% proportion.

Figure 6.15 illustrates that the common causes of dispute in "owner" were "change orders", at 65%, "verbal orders", at 60%, and "owner uncooperative", at 56%. The cause of "owner" issue was given less than 40 % and even 30%, as follows: Failure of the owner in relationship building and exaggerate the business request from the contractor, which was 29%.

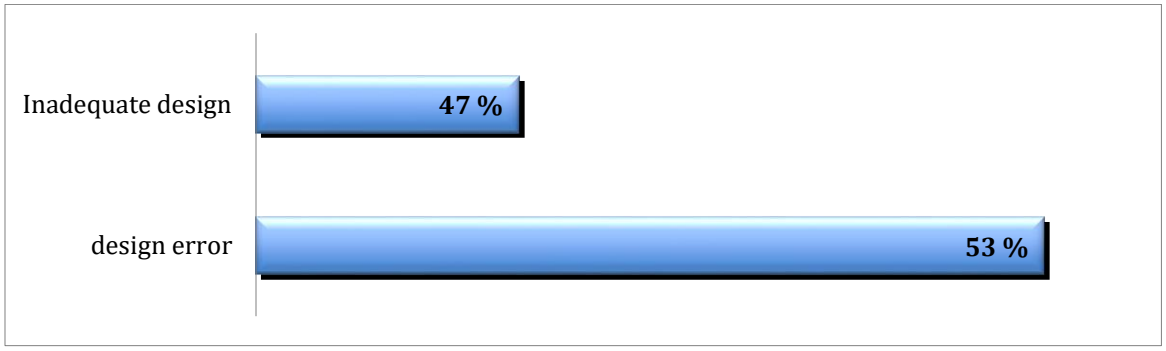


Figure 6-16:Percentage of Causes of disputes (Design)

Participants were asked about the cause of "design" and it was found that the causes of disputes in "design" issues were divided into two categories: design error and inadequate design. The" design error" was the most common cause of dispute in "design" issues, at 53%, while the least common was "inadequate design" at 47%.

Figure 6.16 illustrates that the most common cause of dispute in "design" was (design error) at 53%, and "inadequate design", at 47%, with the two causes being similar in terms of commonness.

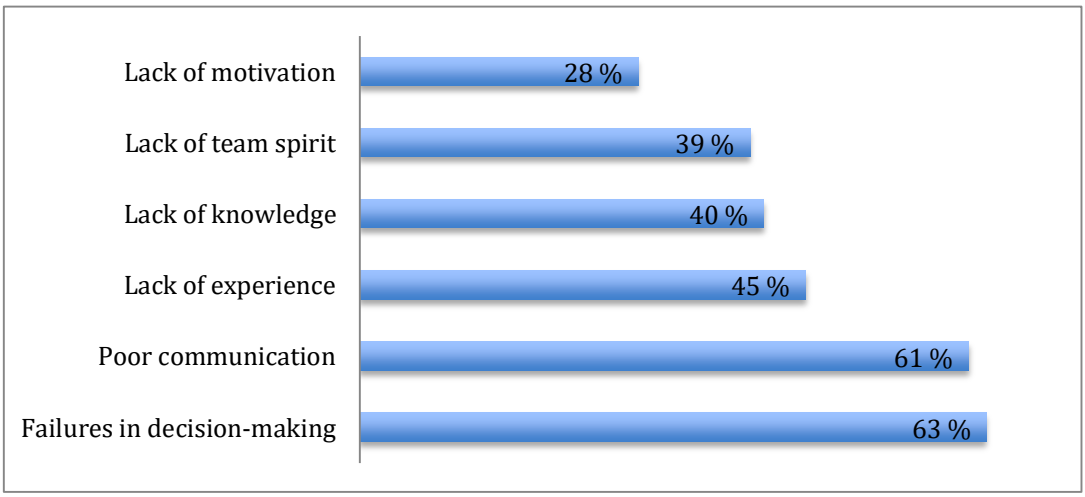


Figure 6-17: Percentage of causes of disputes in SCP (people behaviour)

Participants were asked about the cause of disputes "people behaviour" and it was found that disputes over "people behaviour" could be classified into six categories: Failures in decision-making, poor communication, lack of experience, lack of knowledge, lack of team spirit and lack of motivation.

"Failures in decision-making" was the most common cause of disputes in "people behaviour" disputes, at 63%, while the least common was "lack of motivation", at 28%.

Figure 6.17 illustrates that the most important causes of dispute in people behaviour were three issues and the differences in proportions were about 10% as follows: Failures in decision-making, poor communication and lack of experience, and, whose figures were 63%, 61% and 45% respectively. Lack of experience ranked just above lack of knowledge whose figure was 40%. Lack of team spirit was 39%. Lack of motivation was the least common, at 28%.

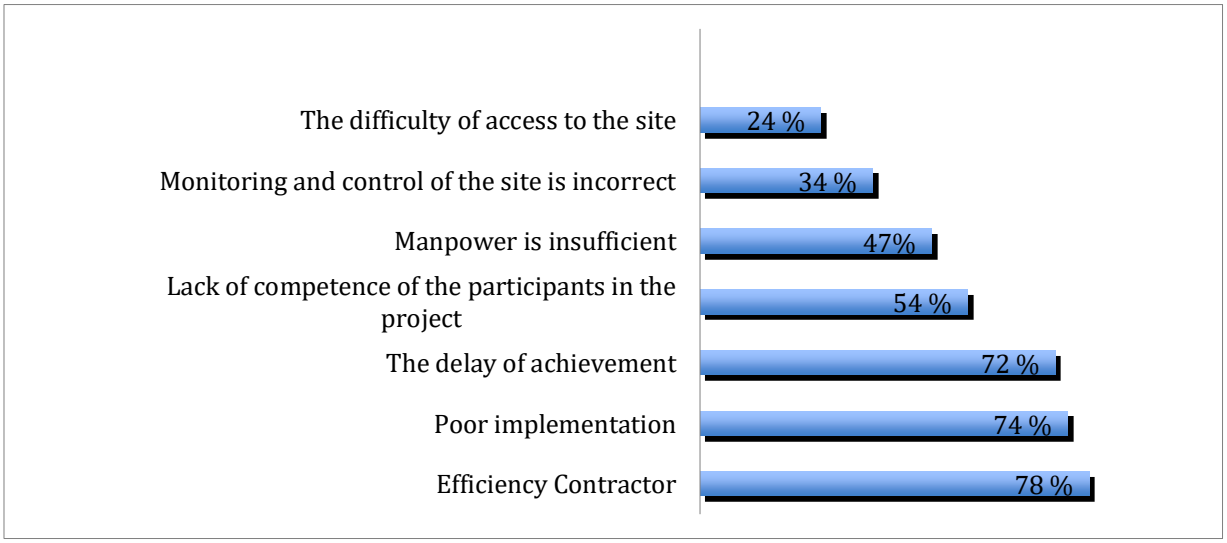


Figure 6-18: Percentage of Causes of disputes (Contractor)

The participants were asked about the causes of contractor' disputes and it was found that the causes of contractors' disputes were in seven categories: Efficiency contractor, poor implementation, delay of achievement, lack of competence of the participants in the project, manpower is insufficient, monitoring and control of the site is incorrect and difficulty of access to the site.

We conclude that based on the number of causes, "efficiency of contractor," had the highest figures of all, at 78%. Meanwhile, we conclude that "the difficulty of Access to the site" had the lowest figures, standing at 24%. Figure 6.18 illustrates that the causes of contractor's disputes are as follows. Three causes of disputes, "efficiency contractor" and "poor implementation," and the delay of achievement, had the highest figures among the other causes, being over 70%. They were 78%, 74% and 72% respectively.

The causes of disputes with high proportions are those over 50%. Ranking lower than the first two causes were one other cause: lack of competence of the participants in the project 54%.

We also conclude that the causes of contractors' disputes with causes as lower than 50%, which were less importance than the previous causes, were the following three: Manpower is insufficient, at 47%, monitoring and control of the site is incorrect, at 34%, and difficulty of access to the site, at 24%.

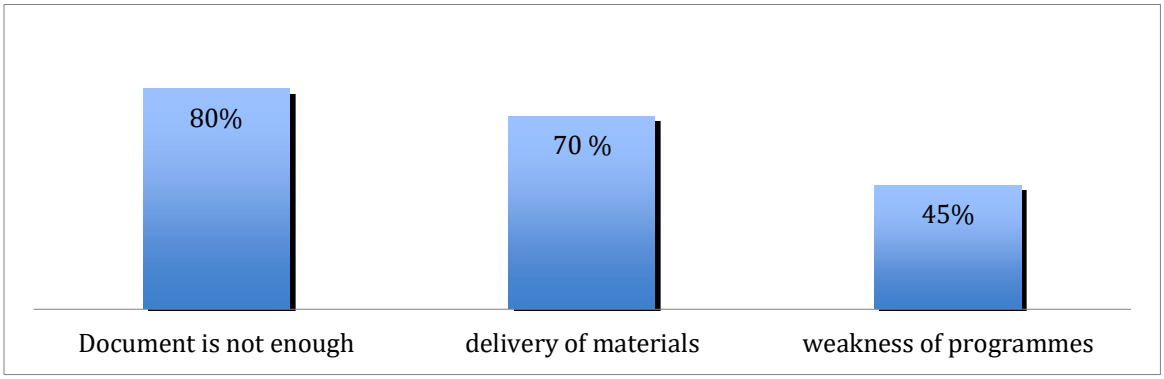


Figure 6-19: Percentage of Causes of disputes (Project related)

The causes of project related disputes consisted of causes of disputes unlike anything previously mentioned, and they vary depending on the origin of cause. Participants were asked about the highest proportion of general causes and it was concluded that the general causes could be classified into 3 different categories: (Document is not enough, delivery of materials, and weakness of programmes). The highest figure in financial disputes was "document is not enough", at 80%. The lowest figure is for "weakness of programmes", at 45%.

Figure 6.19 illustrates that the highest cause of Project related disputes was "document is not enough" according to participants, with a figure of 80%, "Inadequate delivery of materials for the project", stood in second position, at 70%. Finally we see that the least factor to cause disputes according to participants was "weakness of programmes", at 45%

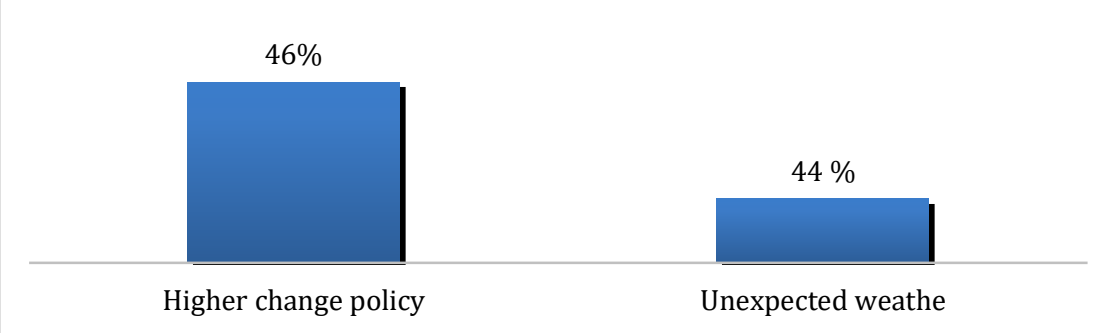


Figure 6-20: Percentage of causes of disputes in saudi construction project (External)

Participants were asked about the causes of external disputes and it was found that the causes of disputes in "external" issues were in two categories: (Higher change policy and unexpected weather). The" Higher change policy" was the most common cause of dispute in "external" issues, at 46%, while the least common was "Unexpected weather", at 44%.

Figure 6.20 illustrates that the most common cause of dispute in "external" was higher change policy, at 46%, and "unexpected weather", at 44%, where the percentage different was not big between the two causes.

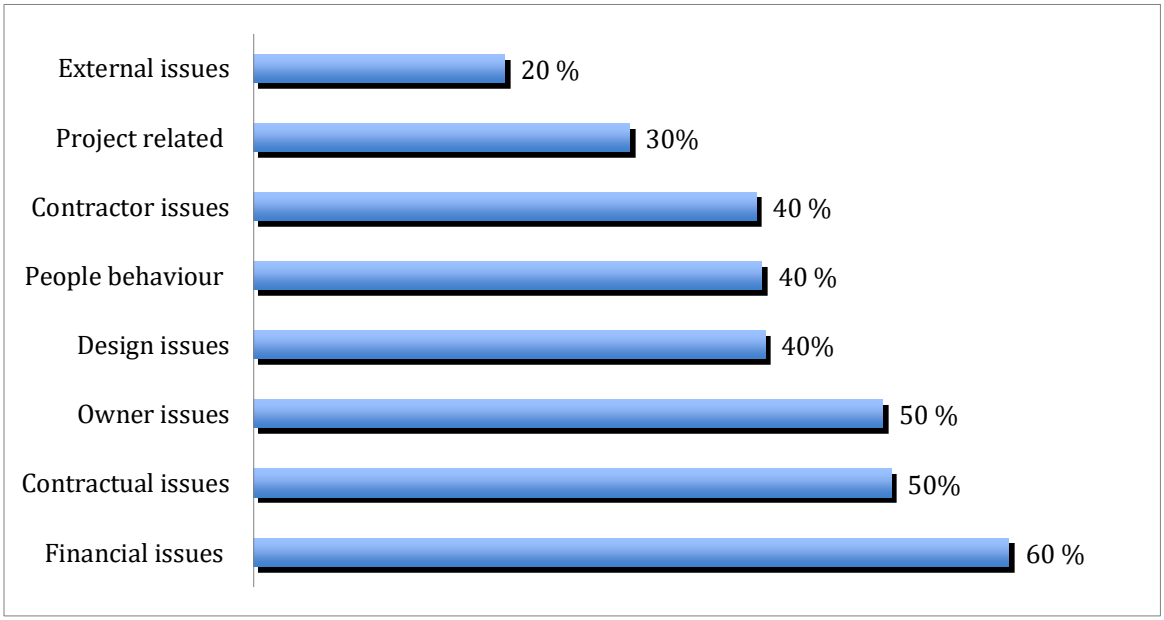


Figure 6-21: Ranking of the causes of disputes in Saudi Construction Project

The participants were asked about the ranking of type causes of disputes in Saudi construction projects and it was found that the causes of disputes were in eight categories based on the previous chapter: Financial, contractual, owner, design, people's behaviour,

contractor, project-related and external. They were asked to rank them by identifying the most important causes of disputes.

Figure 6-21 has the most important categories, including "financial disputes," which had the highest value of all, at 60%. Meanwhile, "external disputes" was the least common type or cause of disputes, at 20%. Next came the less common types or causes of disputes, namely project-related disputes and external disputes, which did not exceed 30% with project related standing at 30% and external disputes at 20%.

6.6 Method of dispute resolution in Saudi construction projects

In this question, a comparison on the approaches used for solving disputes for Saudi Construction Project in the public sector between participants from the public sector, private sector, and those participants who work in both private and public sectors was conducted. Resolutions in public sectors were through litigation and negotiation, according participants from public, private sectors and those who work in both sectors. The figure litigation was over 75%, with that of negotiation in all sectors at less than 40%.

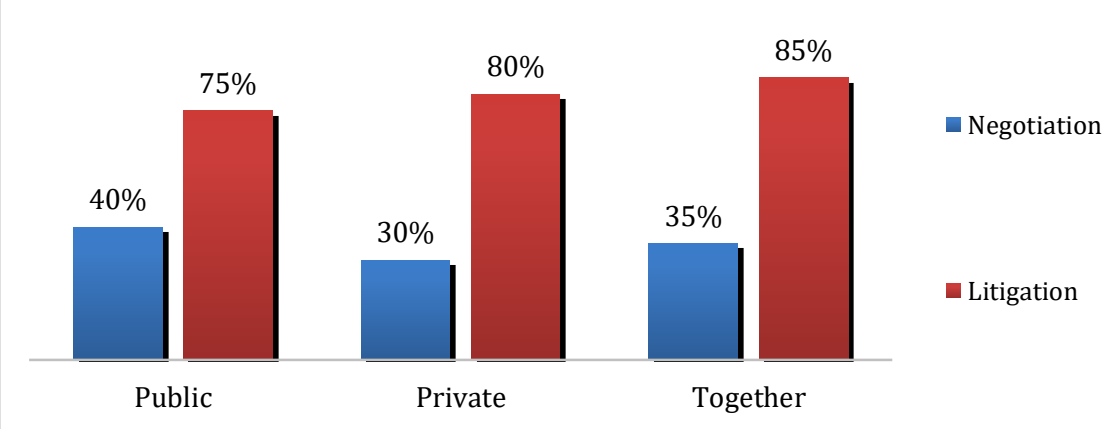


Figure 6-22: Comparing the percentage of use DRM and the participants who work in the public sectorc

Figure 6.22 illustrates that the approach most commonly used in Saudi Construction Project in the public sector for dispute resolution was litigation which had the highest proportion of 85% according to the participants working in both private and public sectors. Participants working in the private sector considered disputes resolved by litigation to be less than that estimated by those working in both private and public sectors, which stood at 80%. Participants from the private sector believed that the method of disputes resolution used for

by litigation in the Saudi construction project in private sector was less, standing at 75%. It is clear that disputes in Saudi construction project in the public sector were mainly resolved by means of negotiation according to participants working in both sectors, with the value standing at 40%. According to participant working both sectors, the method of resolving disputes used in the Saudi construction project public sector was less than what was stated by participants from the public sector, with a figure of 35%. According to participants from the private sector, disputes in the public Saudi Construction Project were resolved through negotiation, standing at 30%.

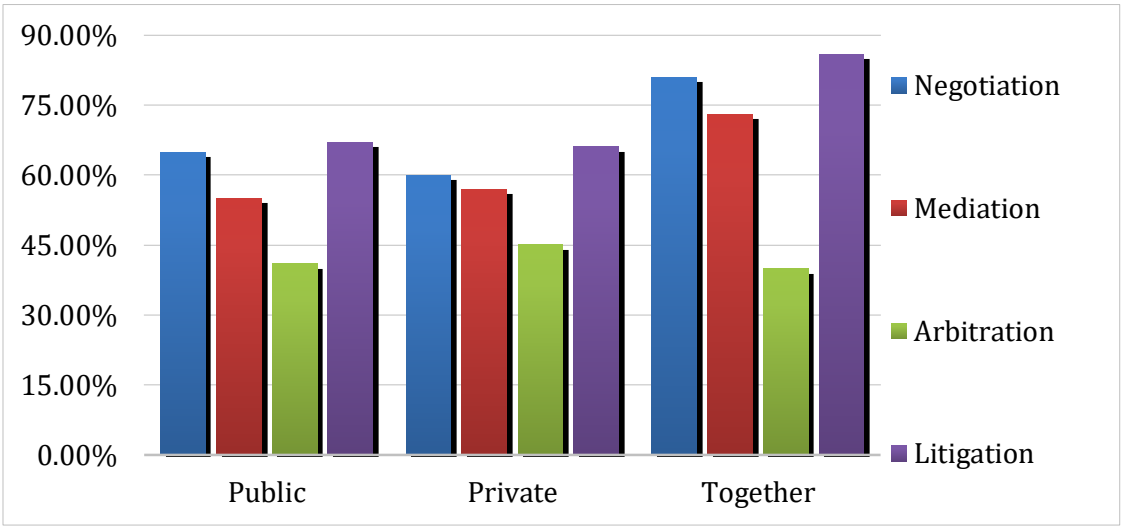


Figure 6-23: Comparing the percentage of use of DRM and the private sector worker

In this question, a comparison of the approaches used for DRM for Saudi Construction Project in the private sector between participants from the public sector, private sector, and those participants working in both the private and public sectors was conducted. It illustrates that disputes in the public sector were resolved through negotiation, litigation and mediation, according to participants from public, private sectors and those working in both sectors. DRM in the private sector use litigation according to participants working both private and public, having a high value at 86%, while the DRM used in private sector for Saudi Construction Project is through arbitration according to participants, standing at 40% for participants working in both sectors.

Figure 6.23 illustrates that all of the participants, regardless of the sector, agreed that using litigation as means resolving disputes is the most common, at 86% for participants working in both sectors and it is higher when compared with the figures from those working in private

sector and public sector. Participants from the public and private sectors were less than those working in both sectors. Their numbers were similar, at 67% and 66% respectively.

Using DRM as a means of negotiation in private sector construction projects is applied mostly after litigation. The figure for this, according to participants who work in both sectors, was 81%. For participants from private sector, it was 65%, very close to the figure from participants working in both sectors. Those working in the private sector in DRM in Saudi Construction Project in the private sector used negotiation the least, with their figure standing at 60%.

The used DRM in private sector Saudi Construction Project was next in third position after litigation and negotiation according to participants. Using mediation, according to those working in both sectors, was more common, at 73%, while participants working in private sector had a different view regarding using mediation, considering it less than did those working in both sectors. The proportion for that was 57%. We can see that, based on the opinions of participants from public sector, mediation has a lower figure, standing at 55%.

The DRM used in the private Saudi Construction Project by means of arbitration was different to the previously used DRM. Previous DRM, according to participants working in both sectors, were higher. While using DRM as a means of arbitration for participants working in private sector was more common, at 45%. Participants working in the public sector were less than those in private sector, at 41%. At the end, we see that the participants working in both sectors together are fewer in number than participants from public sector and in their opinion, DRM by means of mediation was 40%.

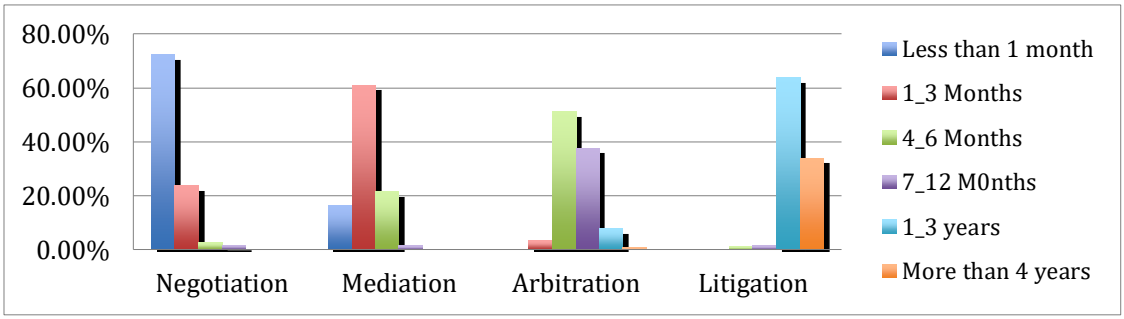


Figure 6-24: Percentage Time to Duration of Method of Dispute Resolution

In this question, the time taken to DRM in private sector was compared. As can be easily observed, the same duration was taken for both sectors in DRM. Considering that the four

different approaches to DRM are litigation, negotiation, arbitration and mediation, the durations that each approach takes were as follows:

Less than a month, 4-6 months, 7-12 months, 1-3 years and over 4 years. According to the participants, negotiation took less time for DRM resolution and the DRM would not be longer than one month, and the proportion for that is 72%, while DRM by means of litigation took the most time, being over 4 years. The proportion of participants who pointed this out was 33%.

Figure 6.24 illustrates that dispute resolution method in Saudi Construction Project by means of litigation took the most time. The participants who stated that DRM by means of litigation took 1 to 3 years constituted around 63% of the sample. While the figure for those who stated that it took over 4 years was 33%.

Those who stated that dispute resolution method by means of litigation took about four to 12 months were small in number, not exceeding 1%. Finally, the timing of over 4 months was not mentioned at all and no value was given to it.

Participants who stated that the dispute resolution method by means of arbitration took four to 6 months were the largest group at 51%, while those who stated that the dispute resolution method by means of mediation took seven to 12 months stood at 37% and came in second position. Next came those participants who said that the dispute resolution method by means of arbitration would take one to three years this group represented a small percentage, at 7%. The smallest group of participants was those who stated that dispute resolution method by means of arbitration would take one to three months, at 3%. Finally, no value was given by the participants with times of less than one month and over four years.

DRM by means of mediation according to participants who was stated that solving disputes by means of mediation takes 1 to 3 months was the most common, at 60%. Those participants who believed that dispute resolution method through mediation took 4 to 6 months were in second position, with 16%. It can be seen that the lowest figure given was very small and relates to those who stated that mediation took seven to 12 months, with a value of 1%. Finally, times of over a year had no value.

Participants who said that dispute resolution method through negotiation took less than a month represented the largest group, at 72%. Meanwhile, we can see that participants who stated that DRM by means of negotiation would take one to three years were in second in position, with a figure of 23%. Those who state that dispute resolution method by means of negotiation will take 4 to 6 months, and its proportion was %2. But those who stated that the dispute resolution method by means of negotiation would take seven to 12 months were very few, compared to the time that was previously given. At the end, we see some timing that has no value, that being for periods of over one year.

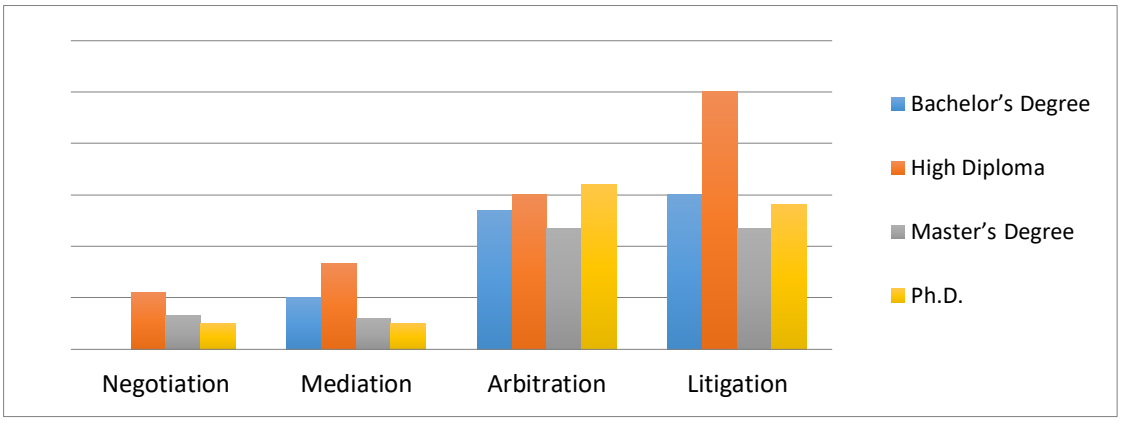


Figure 6-25: Comparing the percentage the cost of DRM used in the SCE and the level of Education

In this question, the cost spent on dispute resolution in the SCE and the level of education of participants are compared.

The DRM in the Saudi Construction Project are negotiation, mediation, arbitration and litigation. The levels of education of the participants are bachelor's degree, master's degree, PhD and higher diploma. As can be seen, dispute resolution using litigation has a high cost and, according to participants, the figure for this is over 47%, being the highest of all. The figure given by those with higher diplomas was 100%. Arbitration stood next to litigation in terms of cost. Using litigation for dispute resolution involved great cost and was over 45% for all of the participants. For those with PhD it was the highest, at 64%. Using mediation as means of solving disputes came after arbitration in terms of cost. It was a low based on the participants' beliefs and was not over 33%. For participants with bachelor's degrees it had the lowest cost, at 22%.

Figure 6.25 illustrates that the method of dispute resolution by means of litigation takes the most expenses and according to participants with higher diplomas, had the highest figure compared to those PhD and master's degrees. The figure for holders of higher diplomas was 100%. It can be seen that participants with higher diplomas believed that litigation had the highest expenses standing in second position, with a figure of 60%. While with a figure of 65%, given by those with PhD considering the cost of litigation in third position. At the end, participants with bachelor degrees stood lowest, with a figure of 47%.

Dispute resolution using arbitration for those with PhD compared to those with higher diplomas, master's degrees and bachelor's degrees had the highest cost and a figure of 64%. It can be noticed that the participants with higher diplomas, in terms of cost of arbitration, stand in the second position with a figure of 60%. Participants with master's degrees came in third with 54%. Ultimately, the participants with master's degrees in terms of cost of arbitration represented the lowest figure, at 46%.

Using mediation for dispute resolution was considered a low cost approach by all of the participants and the lowest prices are suggested by those with PhD with the value for the cost not exceeding 10%. It can be observed that figure for the cost using mediation based on those with master's degrees did not exceed 12%. Ultimately, the highest cost of dispute resolution through mediation was the opinion of those with higher diplomas who said that the figure for its cost was 22%.

Dispute resolution using negotiation, according to participants was very low cost and, in this case, the lowest cost refers to those with master's degrees, with the value not exceeding 20%. Finally, according to participants with higher diplomas, the most costly method of dispute resolution was using negotiation with the figure for the cost of negotiation at 22%.

6.7 Critical success factors for Alternative dispute resolution

Figure 6.26 illustrates that the ranking of critical success factors for Alternative dispute resolution in Saudi construction projects can be categorised using 11 factors: speed, economy, flexibility, confidence, neutrality, fairness, maintaining relationships and privacy, psychological, reputation and being non-adversarial.

From figure 6.26 it is noted that the most effective critical success factor for dealing with Alternative dispute resolution in SCP was speed, at 100%. The least successful factor for ADR was non-adversarial, at 20.87%.

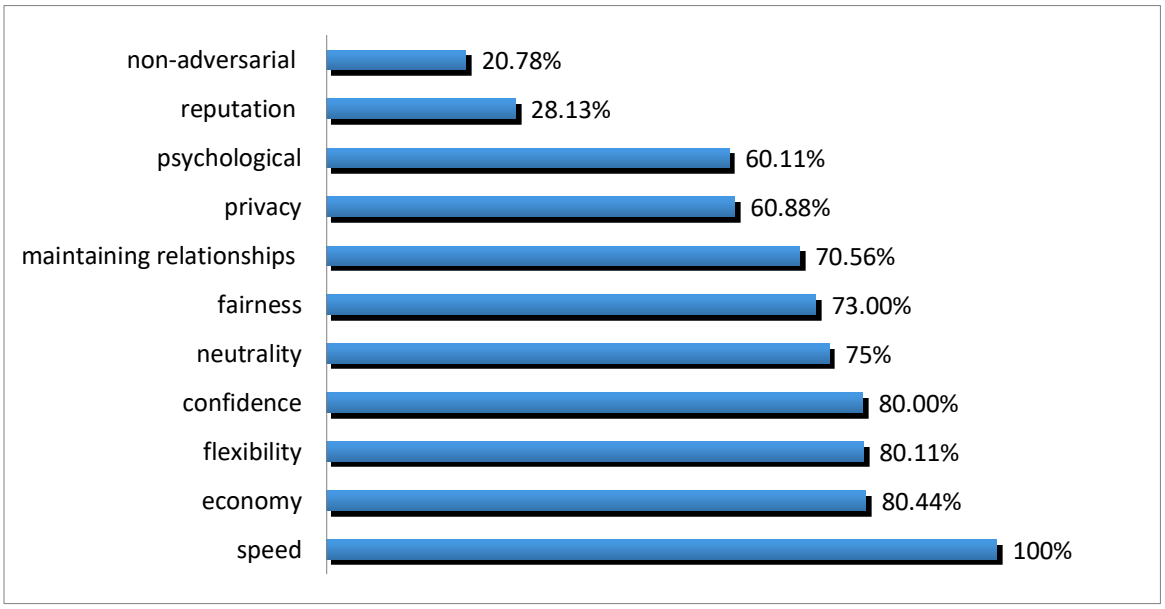


Figure 6-26: Ranking of critical success factors for ADR in Saudi Construction Projects

It is also observed that the first three critical success factors (economy, flexibility and confidence) after speed were all over 80%, with the next three (neutrality, fairness, maintaining relationships) over 70%. Finally, only two of the eleven critical success factors had values below 30%, those being non-adversarial (%20) and reputation (28%) respectively.

6.8 Barriers to using ADR in Saudi construction project

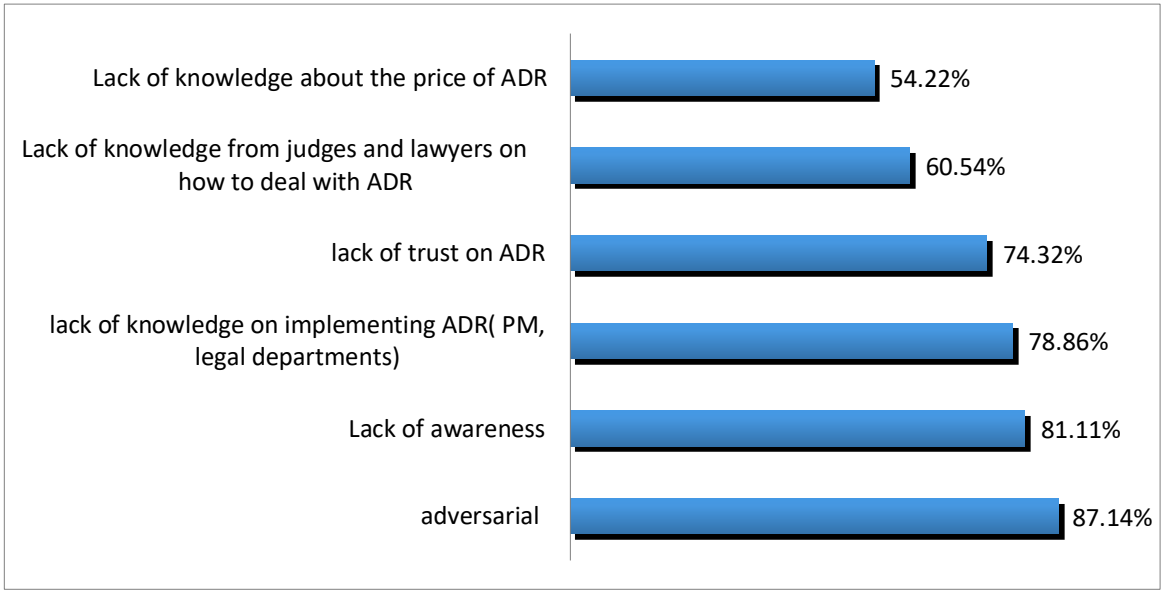


Figure 6-27: Significant barriers preventing the use of ADR in Saudi Construction project (culture)

Figure 6.27 illustrates that cultural barriers to ADR can be divided into 6 categories which are: adversarial culture, lack of awareness, lack of knowledge on implementing ADR (PM, legal departments), lack of trust of ADR, lack of knowledge from judges and lawyers on how to deal with ADR and lack of knowledge about the price of ADR. According to the participants, all of these barriers were quite significant as they all exceeded 50%. It was observed that the top three cultural barriers preventing the use of ADR were adversarial culture (87.14%), lack of awareness (81.11%), and lack of knowledge on implementing ADR (PM, legal departments)(78.68%). Although the proportion is considered as a high, it is the least in preventing the use of ADR, while and lack of trust on ADR that is 74.32%. The two lowest barriers in figure 6.27 were lack of knowledge from judges and lawyers on how to deal with ADR, at 60.54%, and lack of knowledge about the price of ADR, at 54.22%.

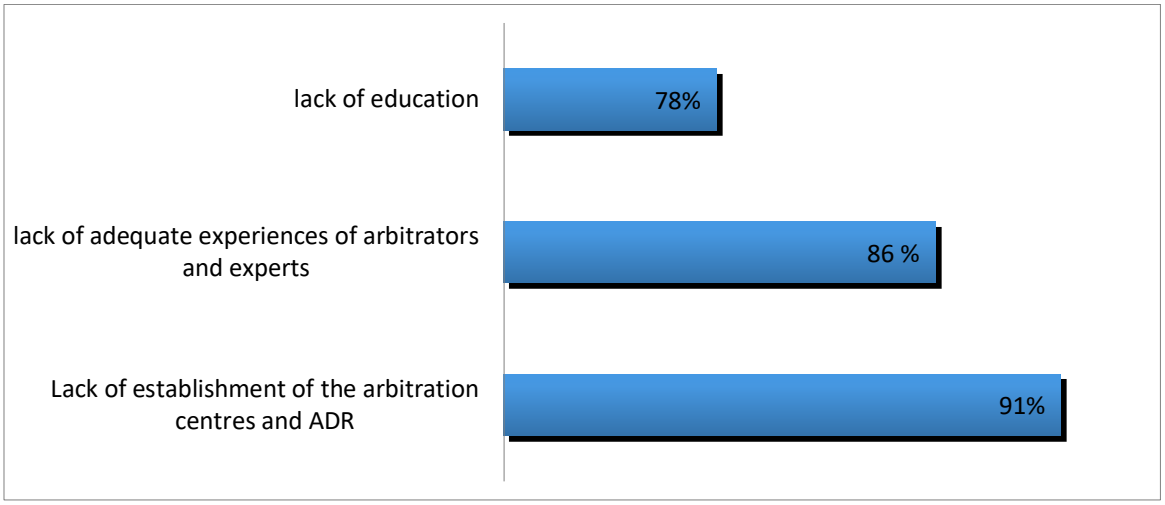


Figure 6-28: Significant barriers that prevent the use of ADR in Saudi Construction Project (development and rehabilitation)

Development and rehabilitation barriers that prevent the use of ADR can be classified into 3 categories: lack of establishment of arbitration centres and ADR, lack of experience from arbitrations and experts and lack of education.

From Figure 6.28 illustrated that lack of establishment of the arbitration centre and ADR, and lack of experience of arbitration are both quite high, at 91% and 86% respectively. The lowest barrier was lack of education 78%, which, compared to previous barriers, was one that caused the least prevention in using ADR in Saudi Construction Project, although the figure in this chart was still high.

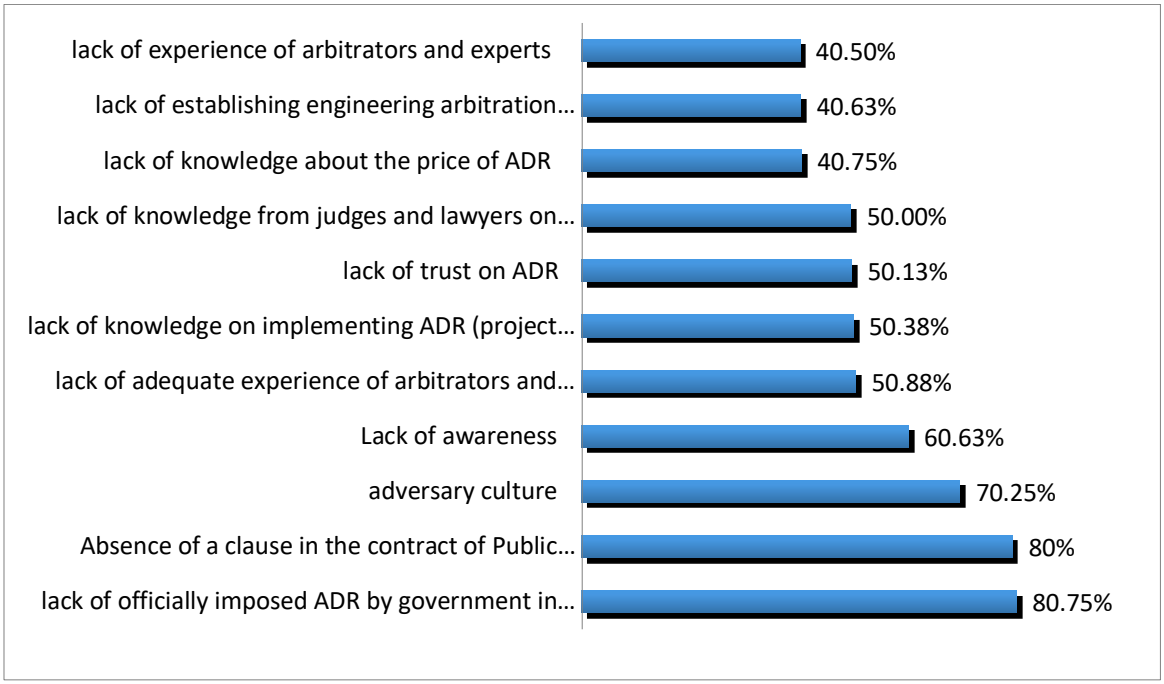
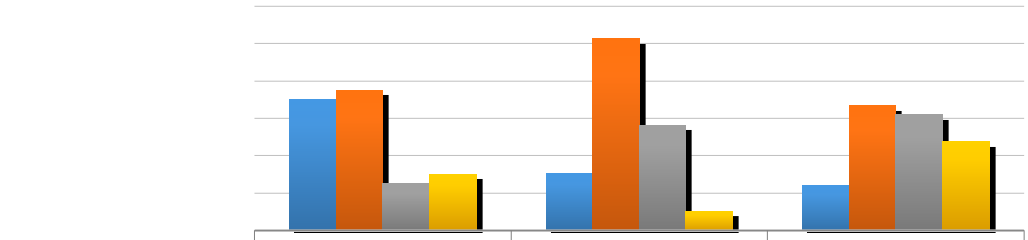


Figure 6-29: Ranking barriers that prevent the use of ADR in Saudi Construction Project (governmental, contractual, cultural and development and (rehabilitation))

Figure 6.29 illustrates the eleven barriers that prevent the use of ADR in Saudi Construction Project (governmental, contractual, cultural and development, and rehabilitation): lack of officially imposed ADR by government in SCP (80%), absence of a clause in the contract of Public Works which allows the use of ADR in construction projects (80%), adversary culture (70.25%), lack of awareness (60.63%), lack of adequate experience of arbitrators and engineers (50.88%), lack of knowledge on implementing ADR (project management, legal departments) (50.38%), lack of trust on ADR (50.13%), lack of knowledge from judges and lawyers on how to deal with ADR (50.00%), lack of knowledge about the price of ADR (40.75%), lack of establishing engineering arbitration centres and ADR for solving disputes (40.63%), and finally, lack of experience of arbitrators and experts (40.50%).

It is noted that the barrier with the highest percentage among participants was the lack of officially imposed ADR by (government barriers) in Saudi Construction Project, at 80.75%, while the second highest was absence of a clause in Public Works contracts to allow the use of ADR in construction projects (contractor barriers), at 80%, with the third barrier being adversary culture (culture barriers), at 70.25%. The barrier with the lowest percentage was lack of experience of arbitrators and experts (development and rehabilitations), which was 40.50%.



	Owner	Contractor	Consultant
Contractual	35.00%	15.38%	11.90%
Government	37.50%	51.28%	33.33%
Culture	12.50%	28.21%	30.95%
Development and rehabilitation	15.00%	5.13%	23.81%

Figure 6-30: Percentage of significant category barriers preventing the use ADR in relation to owner, contractor and consultant

In this question, a comparison was conducted on the four categories of barriers preventing dispute resolution in construction projects, such as contractual, governmental, cultural, development and rehabilitation, based on the role of the owner, contractor and consultant.

In the case of all three participants, the major barrier to ADR was governmental, with this reason cited by 50% of the contractor participants involved in the study and owners and consultants just below 40% in the same category. This category also represented the highest category barrier of the four measured. The category barrier with the greatest range of divergence from the highest to lowest figures was in the contractual area. Finally, the least important barrier, as regarded by all three participants, was development and rehabilitation, with the lowest figure in this category barrier being less than 6%.

It was also observed that all three participants had differing views on what constituted the least important category barrier for them in this question. Owners cited cultural barrier as being the least important, at 12.50%, with contractors citing development and rehabilitation at 5.30%, and consultants cited contractual barriers at 11.90%. This shows a divergence of views on what is the least important category barrier preventing the use of ADR.

6.9 Comparison between the dispute resolution method with the type causes of disputes

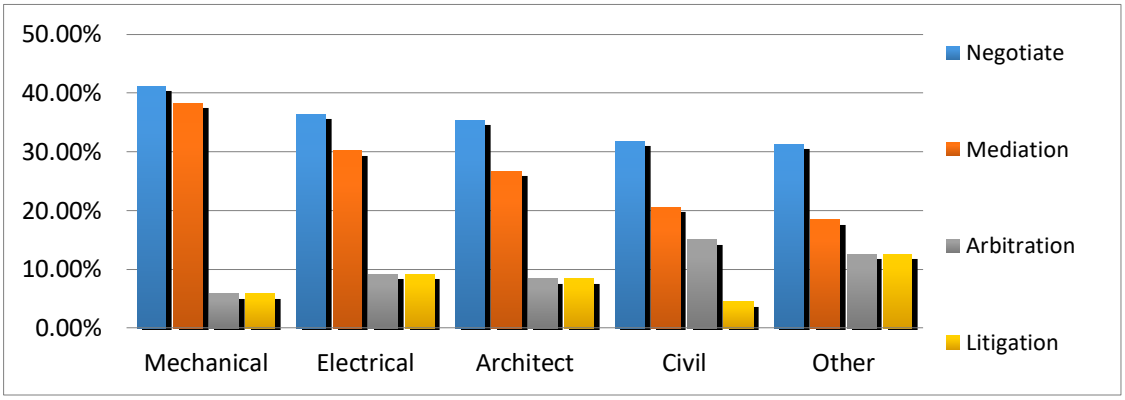


Figure 6-31: Comparing the percentage of the Dispute Resolution method for the current financal causes of disputes in private sector and background classification

In this question, the participants were asked about the best resolution for financial disputes in current and later construction projects using a variety of methods aimed at dispute resolution, such as negotiation, mediation, arbitration and litigation. These were all compared. The participants were all holders of bachelor's degrees in engineering, architecture or electrical and mechanical engineering.

The most preferred method for dispute resolution according to all participants was negotiation, ranging from around 30-40% across all job categories. Even those participants who did not fall into one of the job categories and were classified as 'others' cited negotiation as their first choice for dispute resolution. In contrast, the least preferred method for dispute resolution was litigation (perhaps due to the fact that it is considered a lengthy and costly DRM), with most job categories recording less than 10% for this method. This method was also least favoured by those in the 'other' job category.

It is also significant that civil engineers did not view mediation as a dispute resolution technique as strongly as the other engineers did in this question. However, of all of the engineer involved, they were foremost in citing arbitration (15%) as being their preferred method of dispute resolution. Finally, in terms of litigation which was the least preferred method of dispute resolution between all participants, it is interesting to note that this category was foremost amongst 'other' workers

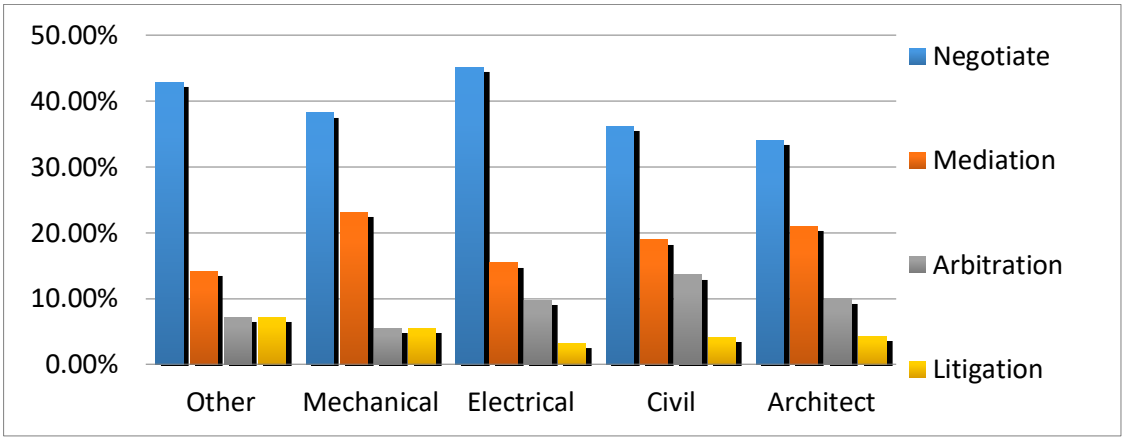


Figure 6-32: Comparison of the percentage of the Dispute Resolution method for the current causes of contractual of disputes in private sector and background classification

In this question, a comparison was conducted between the best resolutions for temporarily resolving contractual disputes in construction projects (i.e. the short term). The methods used for resolving the disputes were negotiation, mediation, arbitration and litigation. Once more, all participants were degree holders (bachelor's degrees) and worked as civil engineers, architects, electrical engineers, mechanical engineers or in the last category which was called other expertise. Like the previous question, negotiation was cited as the preferred method for dispute resolution amongst all participants, with values ranging from just over 34% to just over 45% across all job categories. The highest percentage given from across all job categories was from electrical engineers in the area of negotiation (45%) with the lowest percentage being cited by mechanical engineers in the area of litigation for dispute resolution.

The second most effective method for dispute resolution in Saudi Construction Project was mediation, with the highest figure of 23% being cited by mechanical engineers and the lowest of 14% cited by other engineers.

It is noted that, for the least preferred method of dispute resolution (litigation), the highest percentage cited did not even exceed 10%. This was also the category of dispute resolution where the variation in percentages between all job categories (including other workers) was the lowest, ranging from over 2% to around 8%, therefore approximately less than a 6% difference between all job categories, which was the closest from the dispute resolution methods.

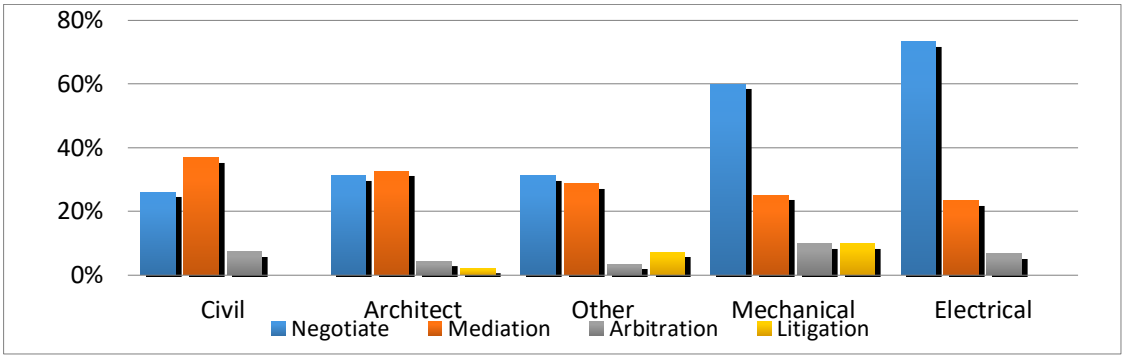


Figure 6-33: Comparing the percentage of the Dispute Resolution method for the current causes (owner and design) of disputes in private sector and background classification

In this question, a comparison was conducted between the most commonly used methods in "owner and design" disputes in current construction projects and those used for project management disputes. The four techniques consisted of negotiation, mediation, arbitration and litigation. Once more, participants in this question were all degree holders across all job categories (civil engineer, architects, electrical engineers, mechanical engineers and other engineers).

The most preferred dispute resolution method for project management according to mechanical and electrical and mechanical engineers was negotiation, with 73% and 60% respectively. However, all other job categories cited this method at around the 30% level, which was considerably lower. In contrast, civil engineers, architects and other workers cited mediation as being on of their most preferred methods of dispute resolution. Litigation as an DRM for dispute resolution was given a low rating by all job categories once more, with even two job categories (civil and electrical engineers) totally ignoring it as an 'owner and design' solution. The highest figure for litigation was around the 10%, as cited by mechanical engineers, which represents a large numerical difference between the most preferred method, that being negotiation at 73%.

This question highlighted a difference in the preferred method for dispute resolution, with civil engineers and architects preferring mediation, but the remaining job categories (mechanical, electrical and other engineers) preferring negotiation.

Finally, this question illustrated the considerable gap between the two most preferred methods for dispute resolution for 'owner and design' in Dispute Resolution method and the two least preferred methods. Whilst negotiation and mediation were highly favoured by all

job categories, litigation and arbitration were least preferred with the highest figure across all job categories for both of these two methods recorded at around the 10% mark.

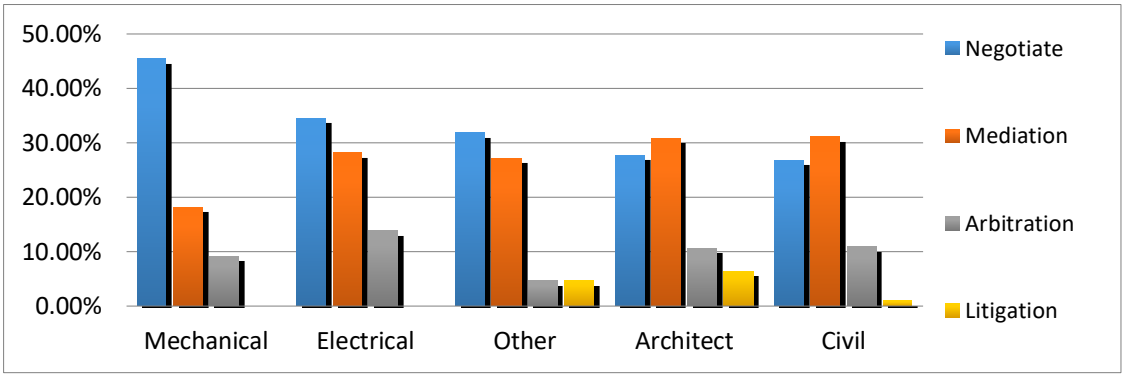


Figure 6-34: Comparing the percentage of the Dispute Resolution method for the current causes (People behaviour) of disputes in private sector and background classification

In this question a comparison was conducted between the Dispute Resolution method and the different backgrounds of engineers in the disputes of People behaviour. The methods considered were negotiation, mediation, arbitration and litigation. The job category participants involved in this question were civil engineer, architects, electrical engineers and mechanical engineers and a group consisting of other engineers. As with previous questions, negotiation stood out as the most preferred method of dispute resolution for people behaviour, cited the most by mechanical engineers at over 40%. The lowest value in this category was around 25%, as cited by civil engineers. In contrast, litigation was the least preferred method of dispute resolution for people behaviour, significantly again did not cite it all (mechanical and electrical engineers), and from those that did, the highest figure was well below 10%. Mediation was a popular choice across all job categories with the closest range in percentage difference (from highest to lowest), going from just over 30% to just under 20%, with architects and civil engineers preferring this method of dispute resolution for SCP more than other job categories. Finally, from the last category in this question (arbitration), the highest figure was cited by electrical engineers at just over 10%, with the lowest percentage being around 3-4% from other engineers.

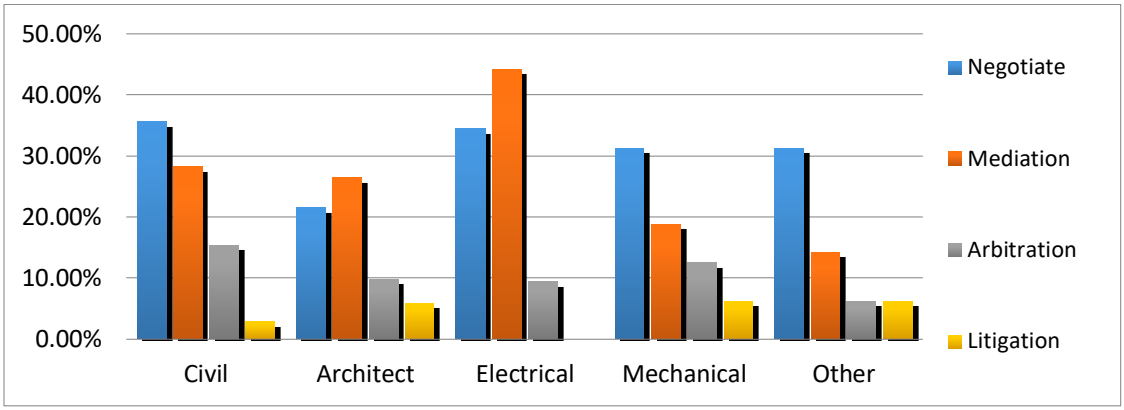


Figure 6-35: Comparing the percentage Dispute Resolution method for the current causes (contractor and project related) of disputes in private sector and background (classification)

In this question a comparison was conducted between current causes (contractor and project related disputes) and Dispute Resolution method such as negotiation, mediation, arbitration and litigation. Participants, as per previous questions are bachelor degree holders from the job categories of civil engineering, architecture, electrical engineering, mechanical engineering and other engineering qualifications. As with previous questions, it is noted that mediation and negotiation are the preferred methods for resolving contractor and project related disputes. The highest percentage was cited for mediation, which was the preferred method of dispute resolution among electrical engineers. The job category that preferred this Dispute Resolution method method the least were other engineers, with a figure slightly over 10%.

The other DRM that was selected with a high percentage across all job categories was negotiation. Civil engineers, mechanical engineers and other engineers all selected this DRM for resolving, "contractor and project related" issues, with a small amount of difference in the values separating them (less than 5% – ranging from 31% to 35%). However, architects were significantly lower at 21.75% for the same category. Arbitration was recorded as being the third most popular method of resolving "contractor and project related" disputes, with civil engineers being the job category that cited it the most at 15.38%, whilst other engineers cited it the least at 6.25%.

Litigation, once more proved to be the least favoured option for DRM relating to "contractor and project related" issues. Some participants essentially ignored it as a possible solution, from those were electrical engineers and other engineers.

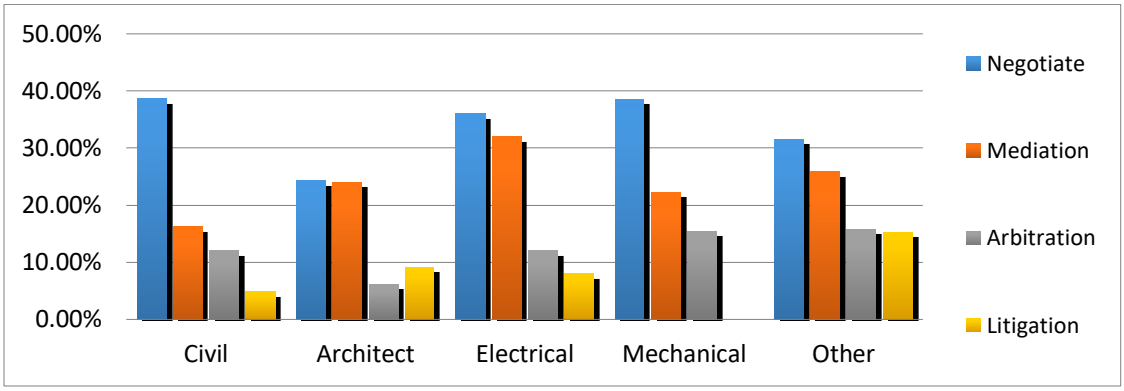


Figure 6-36: Comparing the percentage of the Dispute Resolution method for the current causes (external) of disputes in private sector and background classification

In this question, Dispute Resolution method for external disputes in construction projects, such as negotiation, mediation, arbitration and litigation were discussed and compared among participants with MS qualifications in civil engineering, architecture, electrical engineering, mechanical engineering and other engineering. The results revealed that negotiation and mediation were viewed as being the best methods of solving external disputes. The most popular option for dispute resolution was negotiation, with over 38% of civil engineers and mechanical engineers choosing this option. Once more, litigation proved to be the least popular option for resolving external disputes, with this option being most preferred by other engineers, at 15%, and least preferred by civil engineers, at 4%. Nevertheless, all engineering job categories still cited litigation as a method or option for dispute resolution, except mechanical engineers who did not cite it all.

Figure 6.36 shows that the DRM with the closest range in value between all job categories was arbitration, with the highest figure being 15 % (other engineers) and the lowest being 6% (architects).

The second most popular method for external dispute resolution was mediation, coming just after negotiation. All of the engineers seemed to favour this method, with electrical engineers at 32%, but civil engineers were half of this figure at just over 16%.

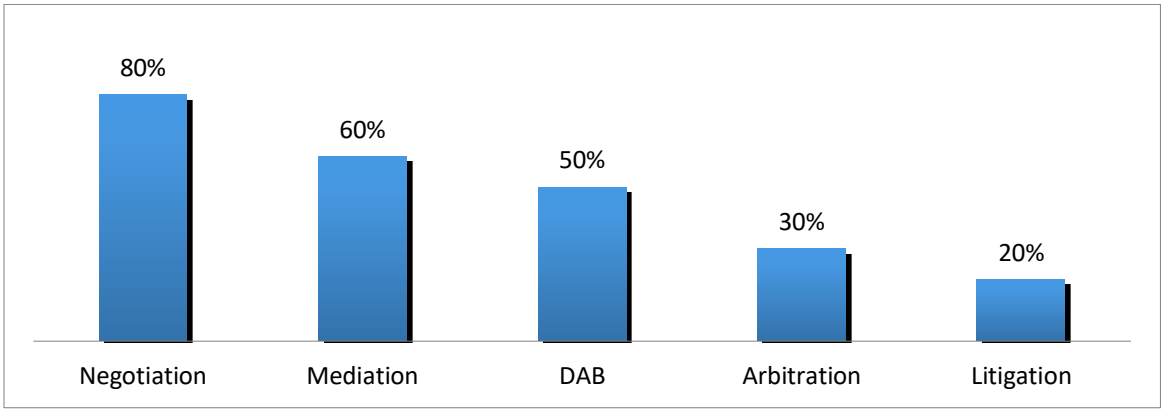


Figure 6-37: Ranking the dispute resolution method and its application in Saudi construction project

This question was designed in order to rank the best dispute resolution method used for current disputes in SCP. There were five disputes resolution method selected: negotiation, mediation, DAB, arbitration and litigation. The rationale for using five methods for dispute resolution method was based on the literature review and the previous chapter which confirmed this fact. This method ranking by the method to resolve disputes in Saudi Construction Project Figure 6.37 illustrates that the DRM the three method of dispute resolution which got more than 50% were negotiation (80%), mediation (60%) and DAB (50%). The method of dispute resolution referred to as

"DAB" is unique in this table in that it can be used at the start of a project and continue until the end. The least popular method for dispute resolution was litigation at 20%. This is confirmed by many of the questions and tables/charts in this section which have shown that litigation was the least preferred method of dispute resolution for Saudi construction project.

6.10 Summary

This chapter has presented a quantitative analysis of data from 327 academics, arbitrators and experts with a background in engineering. The first section provided general information about the participants where the containing subsections which 11 questions to ensure from cover all information that important this research. The second section highlighted that disputes in Saudi construction projects can have a major effect in terms of time, cost and quality. The next section features data and results which highlight the types and causes of disputes in Saudi construction Project, ranging from the most important factors to the least important, such as, financial disputes, contractual disputes, owner-related disputes, design-

related disputes, disputes arising from people's behaviour, contractor-related disputes, project-related disputes and external disputes. In the next section, this study examines methods of dispute resolution in Saudi construction Project based on the best dispute resolution categories, namely, negotiation, mediation, DAB, arbitration and litigation. This section also considers the critical success factors for alternative Dispute Resolution, highlighting the 11 most important which are speed, economy, flexibility, confidence, neutrality, fairness, maintaining relationships and privacy, psychology, reputation and being non-adversarial. In the final section, this studies eight types and causes of disputes that had the same of method of dispute resolution.

Chapter 7. Model of Critical Success Factors

7.1 Introduction

This chapter discusses the Interpretive Structural Modelling (ISM) approach as a tool in the pyramid chart categories and the critical success factors of using alternative dispute solutions on Saudi Arabian construction projects. By defining the relationships, and investigating the interrelationships between the eleven important progressing critical success factors and MICMAC analysis, an advantageous tool for allowing practitioners to understand the critical factors of success in the alternative dispute solutions of construction projects can be created. It can be stated here that the main aim of this study is to develop a model of critical success factors for alternative dispute solutions, thus serving to analyse the interaction of the major critical success factors, and helping to improve dispute resolutions in Saudi Arabian construction projects.

7.2 ISM Overview

In 1973, Warfield proposed the ISM-based approach which can be considered as a tentative theoretical framework, in that it encapsulates the way that subject matter experts understand and explain the phenomenon of study (Warfield, 1974). ISM is also useful in that it can summarize and find relationships amongst specific variables, thus defining an issue or problem (Sage, 1977). According to Von Winterfeldt (1980), ISM is a useful tool for the formal representation of a decision-based problem, in that it employs graph and matrix theory notions. Furthermore, Saxena and Vrat (1990) observe that MICMAC analysis is utilized extensively as a way of identifying and analysing variables in accordance to their dependence power and driving power; where the aim of MICMAC is to make analyse driver (influencer) power, and dependence (reliance) power of the factors involved (Mandal and Deshmukh, 1994).

Numerous studies have utilised the ISM approach in the past. Nishat *et al.* (2006) used the ISM method to find out the interrelationships found between various elements linked to a particular problem. Conversely, (2009) and Sagheer *et al.* (2009) utilised ISM to find out and analyse the critical factors that affect standards compliance and their level of effect in the developing world's food industry. Manoharan *et al.* (2010) employed ISM to analyse the interrelationships of factors of performance appraisal, and to further plan a training programme for employees.

ISM was further deployed by Lin *et al.* (2011) in order to understand the causal interrelationships of a vendor performance evaluation framework. Overall, perhaps the merit and wide use of the ISM process can be seen in that it transforms poorly articulated and unclear system mental models, into well-defined and visible models that can be utilised for various purposes (Mishra *et al.*, 2012).

7.3 ISM Methodology

Interpretive Structural Modelling (ISM) is a methodological approach to identification of the various elements underlying a problem, or any variables related to an issue, and then using a group-solving technique to develop such elements. Accordingly, there are eleven critical success factors determined for ADR, where the interaction amongst these factors are analysed using ISM. Based on the dependency or driving level of factors and utilising the MICMAC technique, the factors can be further classified into four areas; dependent, autonomous, driving and linage. Thus, ISM is a modelling technique whereby a diagraph model is used to portray the overall structure and specific variable relationships for the system under consideration. As such, the ISM method can be utilised to employ a process of logical and systematic thinking in the approach of a complex issue, and then communicating the results of the said process to others (Malone, 1975). Thus, this methodology is suitable for use by professionals or academics that are conversant with the challenge or problem's context (Agarwal *et al.*, 2007).

The tool of the Interpretive Structural Modelling (ISM) approach is discussed throughout this chapter, in relation to the categories of the pyramid chart, with an analysis of critical success factors that present potential variations to dispute solutions in regards to construction projects in KSA. The tool becomes advantageous in allowing practitioners to comprehend the critical success factors for alternative disputes resolution in construction projects, as the relationships become defined, while the eleven critical success factors for ADR and MICMAC analysis are evaluated.

Following on from this, the main aim of this research hopes to advance a model of critical success factors that present solutions for alternative disputes, and thus, present an analysis of the interaction between the substantial factors, and assist in improving construction projects and their dispute resolutions within Saudi Arabia. Nevertheless, there are drawbacks to the ISM methodology, as the variables can often be judged by an individual, which may lead towards an element of subjectivity. Indeed, the variables and their perception depend on individual

comprehension of the organisation, as well as familiarity with how it operates, which can affect the model due to bias (Kannan and Haq, 2007).

7.4 CSF Model Development

When developing the critical success factor (CSF) model for alternative dispute resolution in Saudi Arabian construction projects, by using ISM, Sharma (2013) notes that a number of stages should be followed. These are:

- Finding what factors that related to the problem. This could be completed through the distribution of surveys or by employing a group problem solving technique.
- Forming a contextual relationship between factors in the sense of which pair of factors could be examined.
- Developing a structural self-interaction matrix (SSIM) of the factors, which will serve to reveal the pair-wise relationship amongst system factors (this matrix is subsequently checked for transitivity).
- Developing a reachability matrix from the results of the SSIM.
- Partitioning the reachability matrix into diverse levels.
- Converting the reachability matrix into a conical form.
- Drawing a diagraph based on the relationship indicated in the reachability matrix and removes any transitive connections.
- Converting the resultant diagraph into a model based on ISM, by using the statements instead of factor nodes.
- Check the model in order to find out any conceptual inconsistencies and make necessary adjustments.

The next sections illustrated below will depict the actual levels that develop a CSF model by ISM.

7.4.1 Structural Self-Interactive Matrix (SSIM)

Accordingly, a Structural Self-Interactive Matrix (SSIM) table for analysing the contextual relationship between the 11 critical success factors for ADR can be drawn. This matrix signifies of how the relationship is directed between two factors (i, which is placed on the horizontal axis and j which is placed on the vertical axis) by a pairwise comparison of factors. It is for this

reason that the symbols V, A, X and O were used. The symbol of V represents the relation from factor i to factor j; if the factor i affects on or reaches to the j factor. The symbol A represents the relation from factor j to factor i; if factor j reaches to factor i. The symbol X represents a relationship in both directions; if the factors i and j reach each other. Finally, the symbol O represents no relationship between the two factors; if factors i and j are unrelated. As Warfield (1974) implied that the optimum group number would be between 5 and 10 respondents, the basis of the SSIM came from questions asked to 13 academics, experts and arbitrators. Table 7.1 depicts the structural self-interaction matrix.

Table 7-1: Structural Self-Interaction Matrix (SSIM).

No		1	2	3	4	5	6	7	8	9	10	11
		Speed	Economy	Flexibility	Privacy	laintaining Relationship	Confidence	Neutraility	Fairness	Psychological	Reputation	Non-advirsal
1	Speed	x	v	v	o	v	v	o	v	v	o	o
2	Economy	A	x	v	o	v	v	o	o	o	o	o
3	Flexibility	A	A	x	o	v	v	o	O	x	o	o
4	Privacy	O	O	O	x	A	A	O	O	A	v	o
5	ning Relati	A	A	A	V	x	A	A	A	X	x	v
6	Confidence	O	A	A	V	V	x	V	V	A	v	v
7	Neutraility	O	O	O	O	V	A	x	V	V	o	o
8	Fairness	A	O	O	O	V	A	A	X	V	o	v
9	sychologica	A	O	A	X	A	X	A	A	x	v	v
10	Reputation	O	O	O	A	X	A	O	O	V	x	x
11	Non-advirsa	O	O	O	O	A	A	O	A	A	x	x

7.4.2 Initial Reachability Matrix (IR)

After the completion of the Structural Self-Interaction Matrix (SSIM), the results can be converted into a Reachability Matrix (RM), by substituting the factors V, A, X and O by 1 or 0. Thus, the rules of the substitution of 1s and 0s are as follows:

If the i and j entry in the Structural Self-Interaction Matrix (SSIM) is V, then the i and j entry in the reachability matrix will be 1 and the j and i entry is 0.

If the i and j entry in the Structural Self-Interaction Matrix (SSIM) is A, then the i and j entry in the reachability matrix will be 0 and the j and i entry is 1.

If the i and j entry in the Structural Self-Interaction Matrix (SSIM) is X, then the i and j entry in the reachability matrix will be 1 and the j and i entry is 1.

If the i and j entry in the Structural Self-Interaction Matrix (SSIM) is O, then the i and j entry in the reachability matrix will be 0 and the j and i entry is 0.

The initial reachability matrix for the critical success factors is depicted in Table 7.2.

Table 7-2: Initial Reachability Matrix

No		1	2	3	4	5	6	7	8	9	10	11	
		Speed	Economy	Flexibility	Privacy	laintaining Relationship	Confidence	Neutraility	Fairness	Psychological	Reputation	Non-advirsal	Driving Power
1	Speed	1	1	1	0	1	1	0	1	1	0	0	7
2	Economy	0	1	1	0	1	1	0	0	0	0	0	4
3	Flexibility	0	0	1	0	1	1	0	0	1	0	0	4
4	Privacy	0	0	0	1	0	0	0	0	1	1	0	3
5	ining Relatio	0	0	0	1	1	0	0	0	1	1	1	5
6	Confidence	0	0	0	1	1	1	1	1	1	1	1	8
7	Neutraility	0	0	0	0	1	0	1	1	1	0	0	4
8	Fairness	0	0	0	0	1	0	0	1	1	0	1	4
9	Psychological	0	0	1	1	1	1	0	0	1	1	1	7
10	Reputation	0	0	0	0	1	0	0	0	0	1	1	3
11	Non-advirsal	0	0	0	0	0	0	0	0	0	1	1	2
Dependence Po		1	2	4	4	9	5	2	4	8	6	6	

7.4.3 Level Partitions

Warfield (1974) indicates that the reachability and antecedent set of each variable can be found in the final reachability matrix. Accordingly, a particular variable's 'reachability set' is constructed of the variable itself and the other variables that it may help achieve. This is also the case for the 'antecedent set', and subsequently, the intersection of these two sets is derived for all variables. The top-level position in the ISM hierarchy is given to the variable that has the same reachability and intersection sets, as these will not be useful in achieving any alternate variable that is above their own level. Thus, after identifying the top-level factor, this can be disregarded in relation to the remaining variables. From the first iteration table (7.3), it can be seen that factors 10 and 11 are found at level 1, and thus these are positioned at the top of the ISM model, before being discarded from the other remaining factors, and the iterative procedure is thus continued until iteration 9 (Table 7.11).

Table 7-3: factors (10 and 11) Iteration 1.

	Factors	reachability set	AntecedentsetIntersect	Intersection set	Level
1	Speed	1,2,3,5,6,8,9	1	1	
2	Economy	2,3,5,6	1,2	2	
3	Flexibility	3,5,6,9	1,2,3,9	3	
4	Privacy	4,9,10	4,5,6,9	4,9	
5	MaintainingRelationships	4,5,9,10,,11	1.2.3.5.6.7.8,9.10	4,9,10	
6	Confidence	4.5.6.7.8,9,10,11	1,2,3,6,9	6,9	
7	Neutraility	5,7,8,9	6,7	7	
8	Fairness	5,8,9,11	1,6,7,8	8	
9	Psychological	3,4,5,6,9,10,11	1,3,4,,5,6,7,8,9	3,4,5,6,9	
10	Reputation	5,10,11	4,5,6,9,10,11	5,10,11	1
11	Non-advirsal	10,11	5,6,8,9.10,11	10,11	1

Table 7-4: factors (4 and 9) Iteration 2.

	Factors	reachability set	AntecedentsetIntersect	Intersection set	Level
1	Speed	1,2,3,5,6,8,9	1	1	
2	Economy	2,3,5,6	1,2	2	
3	Flexibility	3,5,6,9	1,2,3,9	3	
4	Privacy	4,9	4,5,6,9	4,9	2
5	MaintainingRelationships	4,5,9	1.2.3.5.6.7.8,9	4,9	
6	Confidence	4.5.6.7.8,9	1,2,3,6,9	6,9	
7	Neutraility	5,7,8,9	6,7	7	
8	Fairness	5,8,9	1,6,7,8	8	
9	Psychological	3,4,5,6,9	1,3,4,,5,6,7,8,9	3,4,5,6,9	2

Table 7-5: factor (5) Iteration 3.

	Factors	reachability set	AntecedentsetIntersect	Intersection set	Level
1	Speed	1,2,3,5,6,8	1	1	
2	Economy	2,3,5,6	1,2	2	
3	Flexibility	3,5,6	1,2,3	3	
5	Maintaining Relationships	5	1.2.3.5.6.7.8	5	3
6	Confidence	5.6.7.8	1,2,3,6	6	
7	Neutraility	5,7,8	6,7	7	
8	Fairness	5,8	1,6,7,8	8	

Table 7-6: factor (8) Iteration 4.

	Factors	reachability set	AntecedentsetIntersect	Intersection set	Level
1	Speed	1,2,3,6,8	1	1	
2	Economy	2,3,6	1,2	2	
3	Flexibility	3,6	1,2,3	3	
6	Confidence	6.7.8	1,2,3,6	6	
7	Neutraility	7,8	6,7	7	
8	Fairness	8	1,6,7,8	8	4

Table 7-7: factor (7) Iteration 5.

	Factors	reachability set	AntecedentsetIntersect	Intersection set	Level
1	Speed	1,2,3,6	1	1	
2	Economy	2,3,6	1,2	2	
3	Flexibility	3,6	1,2,3	3	
6	Confidence	6.7	1,2,3,6	6	
7	Neutraility	7	6,7	7	5

Table 7-8: factor (6) Iteration 6.

	Factors	reachability set	AntecedentsetIntersect	Intersection set	Level
1	Speed	1,2,3,6	1	1	
2	Economy	2,3,6	1,2	2	
3	Flexibility	3,6	1,2,3	3	
6	Confidence	6	1,2,3,6	6	6

Table 7-9: factor (3) Iteration 7.

	Factors	reachability set	AntecedentsetIntersect	Intersection set	Level
1	Speed	1,2,3	1	1	
2	Economy	2,3	1,2	2	
3	Flexibility	3	1,2,3	3	7

Table 7-10: factor (2) Iteration 8.

	Factors	reachability set	AntecedentsetIntersect	Intersection set	Level
1	Speed	1,2	1	1	
2	Economy	2	1,2	2	8

Table 7-11: factor (1) Iteration 9.

	Factors	reachability set	AntecedentsetIntersect	Intersection set	Level
1	Speed	1	1	1	9

7.4.4 Conical Matrix

The creation of a conical matrix is built on the basis of the partitioned reachability matrix. This is done by rearranging the factors according to their levels, which means that factors possessing the same levels are clustered together. Doing so serves to determine the drive power and dependence power ranking.

7.4.5 ISM Model

This model contributed in understanding the relationship between critical successful factors for alternative dispute resolution in construction projects. There was number of critical successful factors carrying more importance comparing to the others. The advantage of clearly understanding the relationship and connection between these factors will help the concerned entities and ministries and also scholarships, arbitrators, experts and other who are concerned. This model was developed through interviewing 13 academics, arbitrators and experts.

They were asked about eleven successful factors that connect their common relationship. The sample consists of nine levels which are illustrated In the figure 7.1, Starting from the bottom level (9) refers to the speed factor as it is an important factor and determines selection of alternative dispute resolution based on timing. Negotiation method was the fastest method to

resolve disputes because the time factor affects the next factor, level (8), which is economic factor. Since expenditure is a key consideration for parties involved in disputes, the method of dispute resolution which is least expensive will typically encourage parties in the dispute to select this method due to its cost. Expenditure also has an effect on the next level, which is the flexibility factor, and is denoted by level (7) on the figure. This factor is important for selecting a solution for disputes, since flexibility can play a role in influencing factors, such as time and place according to the experts' and arbitrators' opinion. With this method, the parties in the dispute, as well as the arbitrators, may come to an agreement at any time (during the day or night) or at any other time during official working hours, and also in any place other than official places, such as in the hotel lobby/waiting area, or in an office. Flexibility factor will affect the next level on the list, which is level (6) and refers to the trust factor. The trust factor is crucial to all parties involved in the dispute, as selecting a method of dispute resolution is not achieved by trust, since trust is achieved through reputation factor, which is built or developed based on any previous dealings that have occurred between parties. The trust factor also affects the next factor (level 5), which is neutrality factor. Neutrality is considered to be very important to some parties and may therefore be selected, as this may be instrumental in achieving a solution to some disputes, particularly when there are an odd number of arbitrators involved (method of arbitration and DAB). Neutrality factor affects the next level, which is fairness (level 4), which ensures that any verdicts or decisions made, even in the case of a loss or a decision against one party is judicious. Being fair also affects the next factor, which is level 3, and that is relation preservation factor. Relation preservation factor is an important factor for all parties and arbitrators because in some instances, solutions for disputes can cause enmity after being implemented; however, some solutions, in contrast, can cause good relationship between parties after being implemented. The relation preservation factor can have an impact on the next two factors, which are the psychosocial and privacy factors. In order to create a good relationship, privacy should be protected and good spirit should be developed and preserved in order to have a good relationship.

The second level factors in the list are the privacy and psychosocial factors, and are also important as having a mutual relationship means having to work to preserve privacy and have a good psychosocial factor. This also works in reverse, as having a good psychosocial factor can be achieved through privacy. The psychosocial factor also impacts on reputation and non-

adversarial factors, both of which are the first level factors in the figure.The arrow linking/between these two illustrate how they can have an effect on each other. If no enmity exists between the parties involved in the dispute, their reputations will get better and after some time, due to their reputations getting better, there should, in theory, be no dispute left.

Due to the mutual relationship between various factors based on the matrix of the final relation tools, a structural model can be developed. The arrow indicates that if there is a relationship between i to j, variables can illustrate them. The arrows that are pointing from 9 to 1 are all pointing in the same direction. Additionally, the arrows at levels 2 to 1 are also going in the same direction, an indication that two factors at both levels (two and one) have strong ties. Speed, economic and flexibility factors have a big impact on selecting the most suitable dispute resolution method in construction projects in Saudi Arabia, but it is worth mentioning that some classical solutions for solving disputes in the state and private sector do not rely on the factors of time, expenditure and flexibility. Following these factors, in terms of importance are trust, neutrality, and relation preservation. Due to their importance, these factors should be considered by decision makers in dispute solutions. Finally, the last of the factors listed are psychosocial, privacy, reputation and non-adversarial. The significance of these factors cannot be said to be any less important than the others in improving dispute resolution in construction projects in KSA .

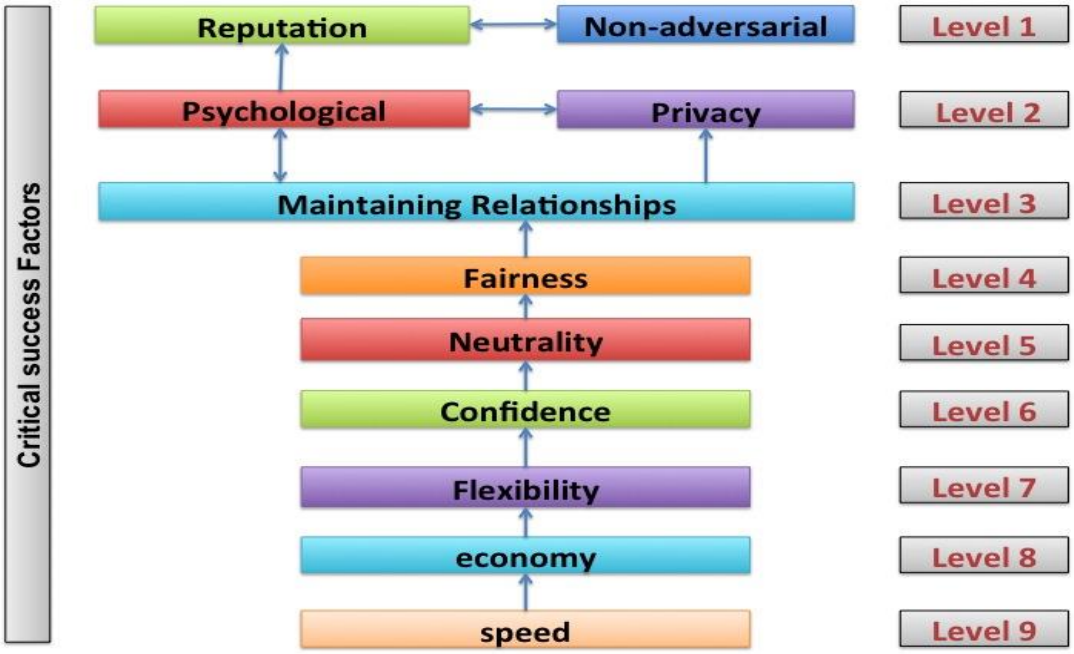


Figure 7-1: ISM Model.

The resulting diagram is depicted in Figure 7.1.

7.4.6 Classification of Factors Using MICMAC Analysis

The ISM model and following MICMAC analysis identified the hierarchical structure and degree of interrelationship between success factors for ADR. The aim of the cross-impact matrix multiplication applied to classification, known as MICMAC, is to provide an analysis of the dependence power and drive power of factors, as shown in Table 7.12. The principle of analysis is based on the multiplication properties of matrices. The barriers can be classified into a further four groups based on the driving power and dependence power, (Attri *et al*., 2013). These are:

Table 7-12: Driving power and dependent power for factors.

No.	Factors	Driving Power	Dependent Power
1	Speed	7	1
2	Economy	4	2
3	Flexibility	4	4
4	Privacy	3	4
5	Maintaining relationship	5	9
6	Confidence	8	5
7	Neutrality	4	2
8	Fairness	4	4
9	Psychological	7	8
10	Reputations	3	6
11	Non-Adversarial	2	6

1) Autonomous Factors are the factors that possess both weak drive power and weak dependence power.
2) Linkage factors are the factors that possess both strong drive power and strong dependence power.
3) Dependent Factors are the factors that possess weak drive power and strong dependence power.
4) Independent Factors are the factors that possess strong drive power and weak dependence power.

Every measure of performance has been placed into four individual factors that are based upon the driving power and dependence they possess (see Table 7-12). These factors are shown as: 1) speed, which is denoted by 7 for driving power and 1 for dependence power, and thus is placed in the fourth group of independent factors; 2) economy, which is denoted by 4 as the driving power and 2 for dependence, and as a result means that it is positioned in the first group; 3) flexibility, which is denoted by 4 as the driving power and the dependence power; and 4) privacy, which is denoted by 3 as the driving power, with 4 as the dependence power. Additionally, the variables' dependence and driver power were analysed by MICMAC analysis, and the drivers were classified into four groups (see Figure 7.2) as follows:

- The autonomous factors represent the first group, which are comprised of weak driving power and weak dependence power, which equates to minimal driving power and dependence; privacy as factor 4; flexibility, fairness as factors 3 and 8, which act as linkage factors; and economy and neutrality as factors 2 and 7, which act as independent factors. Moreover, the autonomous factors may also function as a secondary variable.
- The dependent factors are the second group, which are dependent measures that are denoted by weak driving power, together with strong dependence power. This includes dependent measures: reputation (factor 10) and non-adversarial (factor 11).
- Linkage factors comprised the third group, which have strong driving and dependence power. These include confidence as factor 6; and psychological factors as factor 9. These measures and their subsequent action will result in affecting the other measures.
- Independent factors comprise the fourth group, which are made up of strong driving power, yet have weak dependence. These include speed as a factor.

<table>
<tr><td>9</td><td colspan="3" rowspan="4">Speed
Independent Factors</td><td></td><td></td><td colspan="4" rowspan="4">Psychological
Linkage Factors</td></tr>
<tr><td>8</td><td></td><td>Confidence</td></tr>
<tr><td>7</td><td></td><td></td></tr>
<tr><td>6</td><td></td><td></td></tr>
<tr><td>5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>Maintaining relationship</td></tr>
<tr><td>4</td><td></td><td>Economy
Neutrality</td><td></td><td>Flexibility
Fairness</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>3</td><td colspan="3" rowspan="3">Autonomous Factors</td><td>Privacy</td><td></td><td colspan="4" rowspan="3">Reputations
Dependent Factors

Non-Adversarial</td></tr>
<tr><td>2</td><td></td><td></td></tr>
<tr><td>1</td><td></td><td></td></tr>
<tr><td></td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td></tr>
</table>

Figure 7-2: Classification factors (MICMAC Analysis).

7.5 Summary

This chapter sought to develop the critical success factors for an ADR model in Saudi construction projects by investigating the hierarchical structure and interrelationships of the factors. ISM methodology and MICMAC analysis were adopted to develop the hierarchical structure and explore the relationship model among the critical success factors to improve dispute resolution. The present ISM model can help dispute resolution in Saudi Arabian construction projects through understanding the interaction of 11 critical success factors affecting alternative dispute resolutions, and assist in providing decision makers with a realistic picture to deal with disputes and resolutions in Saudi construction projects.

Chapter 8. Dispute resolution framework

8.1 Introduction

This chapter puts forward the approach taken to develop a framework to improve the efficiency of dispute resolution in Saudi Construction Projects, on the basis of the findings of the literature review provided in Chapters 2 and 3 and the data analysis provided in Chapters 5 and 6. This chapter is divided into five sections: the first presents the different types of disputes in order of importance starting with financial disputes and going on to external dispute; the second talks about critical success factors for alternative dispute resolutions in order of efficiency of resolution; the third presents the methods used in dispute resolutions, starting from negotiation to litigation; the fourth concerns the relationship between type of dispute and method of dispute resolution used and, the fifth focuses on the relationship between critical success factors for alternative dispute resolutions and the method of dispute resolutions used. Finally, a validation of the framework is provided.

8.2 Types of Disputes' causes

There were eight types of disputes identified in the literature review and in the data analysis (Chapters 5). According to the findings based on the analysis of the data (Chapter 6) the following is their ranking in terms of impact: financial disputes, contractual disputes, owner-related disputes, design-related disputes, disputes arising from people's behaviour, contractor-related disputes, project-related disputes and external disputes (Figure 8.1).

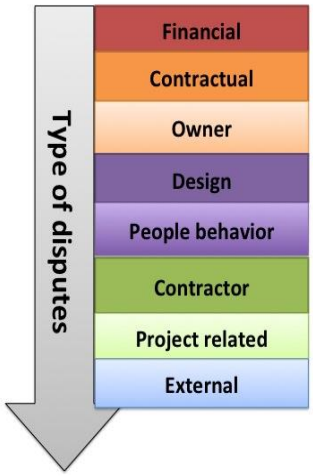


Figure 8-1: Types causes of disputes

8.2.1 Causes of disputes

The data gathered in this study and reported in Chapter 6 indicates that there are specific causes behind each type of dispute. Two important causes of *financial disputes* are late payments and inadequate financial planning. Causes of *contractual disputes* include ambiguous contractual documents and breach of contract. *Owner-related disputes* are often caused because orders are given verbally or changed mid-project. *Design disputes* are often caused by inadequate design. *Disputes caused by people's behaviour* are also often caused by failures in the design and poor communication. *Contractor-related disputes* usually centre on the inefficiency of the contractor and poor implementation. *Project-related disputes* are often caused by insufficient documentation and problems with the delivery of materials and, finally, *external disputes* are caused by unexpected changes in the weather and policy changes (Table 8.1).

Table 8-1: Types causes of disputes

Types of Disputes	Causes of Disputes
1-Financial	**1-Late payments**: Delay in payments, whether by the owner or by the contractor, to the subcontractor is the main reason behind financial disputes. **2- Inadequate financial planning of the project**: There should be adequate financial planning within projects in order to ensure that the project goes ahead as planned.
2-Contractual	**1-Ambiguous contractual documents**: The documents for the contract must be clear for all parties and should be written in language that is understandable to all parties. **2-Breach of contract**: All parties should commit to all terms of the contract.
3-Owner	**1-Change orders**: Owners should be committed to the specifications in the plan. **2-Verbal orders:** All the instructions given by the owner before and during the project must be in writing to ease referring to them during the process of project.
4-Design	**1-Indequate design:** Planner should provide a complete plan in line with policy at the time of implementation.
5-People's behaviour	**1-Failure in the design making:** The decision made by owner or by the project manager or any other individual who has the

	authority to make decision should be conducted in an appropriate time. **2-Poor communication:** To keep up with the project in appropriate way, all the project parties should have connection.
6-Contractor	**1-Efficiency of contractor**: The best contractor should be selected based on experience and previous quality of work. **2-Poor implementation:** To keep up with the project in appropriate way, all the project parties should have connection.
7-Project-related	**1-Insufficient documentation:** Project documents must be complete and ready to be referring to when project parties desire it. **2-Delivery of materials:** The materials that are required for the project should be prepared and there should be possibility of reaching them to the project site at any time and at any place.
8-External	**1-Unexpected weather:** The materials that are required for the project should be prepared and there should be possibility of reaching them to the project site at any time and at any place. **2-Policy changes:** There could be some change implemented by high level organizations in the government to make change on process of project, therefore both parties should be aware of those changes.

In sum, research shows that there are eight types of disputes, the most important being financial and contractual disputes and the least important being external disputes. Each type of dispute has a major trigger. The two main causes of each dispute were identified through data gathered for this study (see Chapter 6).

8.3 Critical success factors for alternative dispute resolution

8.3.1 Introduction

This section presents the critical success factors for alternative dispute resolution in the context of Saudi construction projects. Eleven critical success factors for alternative dispute resolution have been identified in total; the speed of resolution and the economical factor being the two

most important. This chapter is divided into two sections: the first section talks about the order of importance of the factors in general and the second section talks about speed and economy as the two most important factors in dispute resolutions.

8.3.2 Critical success factors for alternative dispute resolution

Based on the findings of the literature review and the data gathered for this study the critical success factor (CSF) framework encompasses nine factors, with and additional two factors (psychological and reputation) emerging from the data analysis (see Chapter 5). The order in which the critical success factors for alternative dispute resolutions are ranked by the ISM Method (see Chapter 7) is: speed, economy, flexibility, confidence, neutrality, fairness, maintaining relationships and privacy, psychological, reputation and being non-adversarial (where privacy is on the same level as psychological and reputation is on the same level as non-adversarial). Speed and economy emerged as the most important critical success factors in alternative dispute resolutions (Figure 8.2).

Figure 8-2: The critical success factors for alternative dispute resolutions

8.3.3 Critical success factors for alternative dispute resolutions (Speed and Economy)

Based on the data given in Chapter 7, which is used by ISM model, speed and economy are the most important critical success factors in alternative dispute resolutions. Table 8.2 describes the effect of these two factors on dispute resolution.

Table 8-2: Description of critical success factors for alternative dispute resolutions (Speed and Economy)

Critical Success Factors for ADR	Description
Speed	Time is important for all parties in any dispute and all parties look forward to seeing the dispute ended as quickly as possible. Therefore, speed is the most important and effective factor in this context. Some alternative dispute resolution processes may take less than a month while litigation may take as long as four years or more.
Economy	A very important factor, which takes priority over other factors, is the economic factor. Some alternative dispute resolution processes may be carried out at no cost while litigation dispute resolutions may be very expensive.

In sum, the least effective critical success factors for alternative dispute resolutions are non-adversarial and reputation while the most important critical success factors for alternative dispute resolutions are speed and economy. Therefore, the next section will focus on the methods used in dispute resolution and the relationship between speed and economy, as the most important critical success factors, and the methods used.

8.4 Method of dispute resolution

8.4.1 Introduction

This section focuses on the methods of dispute resolution used in Saudi construction projects. The literature review findings and data gathered in this study (see Chapter 5) identify five methods of dispute resolution currently being used in Saudi construction projects, namely: negotiations, mediation, DAB, arbitration and litigation. The methods are ranked according to the factors of speed and economy (see Chapter 6).

8.4.2 Method of dispute resolution in relation to speed

This framework is developed based on the data gathered for this study (see Chapter 6). The dispute resolution methods ranked in terms of speed were: negotiation, mediation, DAB,

arbitration and litigation, with negotiations on average lasting less than a month, mediation taking between one and three months and DAB lasting between one to twelve months. The duration for arbitration was about four to twelve months and, finally, litigation lasting from one to four years (Figure 8.3).

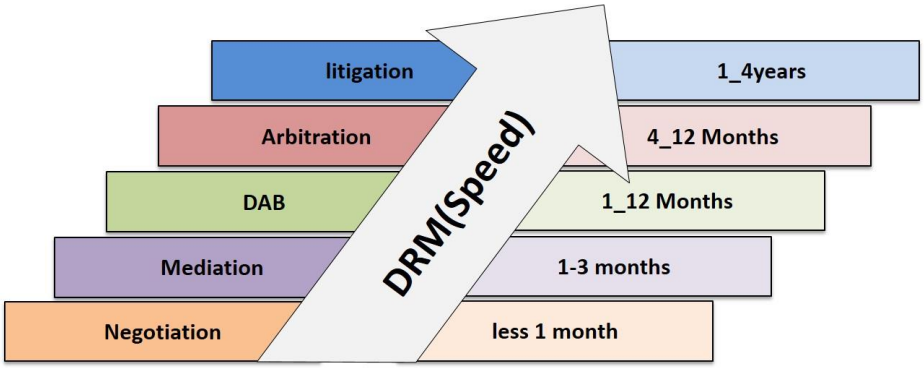


Figure 8-3: : Dispute resolution methods (Speed)

8.4.3 Method of dispute resolution in relation to economy

The dispute resolution methods ranked in terms of economy were: negotiation, mediation, DAB, arbitration and litigation. The cost of negotiation does not exceed 20% at the most, while the cost of mediation is 30%, that of DAB is 40%, for arbitration is up to 60% and the cost of litigation is 100 % (Figure 8.4).

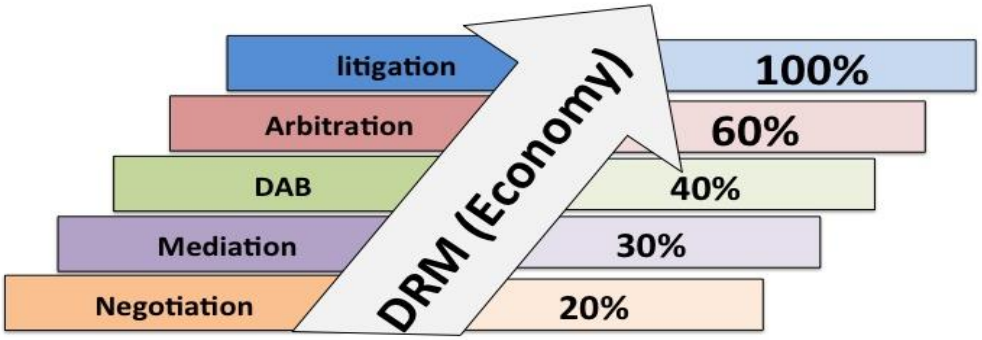


Figure 8-4: Dispute resolution methods (Economy)

8.4.4 Method of dispute resolution in relation to both speed and economy

When the factors of speed and economy are both taken into the dispute resolution methods are ranked as follows: negotiation, mediation, DAB, arbitration and litigation, where litigation is the most expensive and takes the longest and negotiation takes the least time at the lowest cost (Figure 8.5).

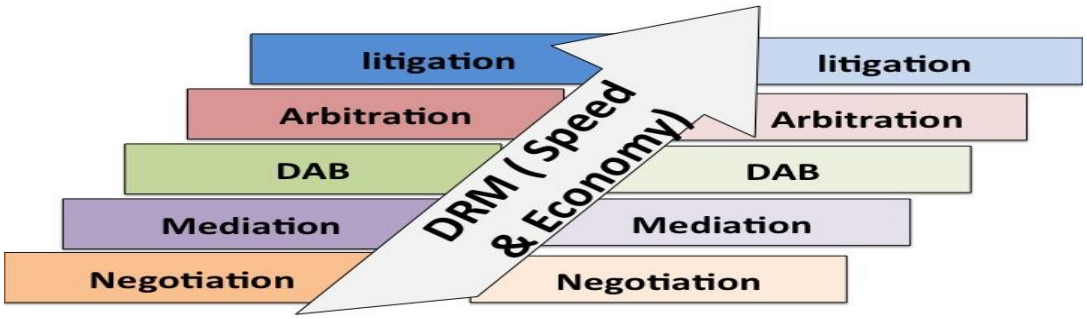


Figure 8-5: Dispute resolution methods (Speed and Economy)

8.5 Types of Disputes' causes and the relationship with methods of dispute resolution

8.5.1 Introduction

This section discusses the relationship between the type of dispute and the method of dispute resolution used based on the data gathered for this study (see Chapters 6). The types of disputes were listed as follows: financial disputes, contractual disputes, owner-related disputes, design-related disputes, disputes arising from people's behaviour, contractor-related disputes, project-related disputes and external disputes.

8.5.2 Financial disputes, contractual disputes, owner-related disputes, design-related disputes, disputes arising from people's behaviour, contractor-related disputes, project-related disputes and external disputes' relationship with methods of dispute resolution

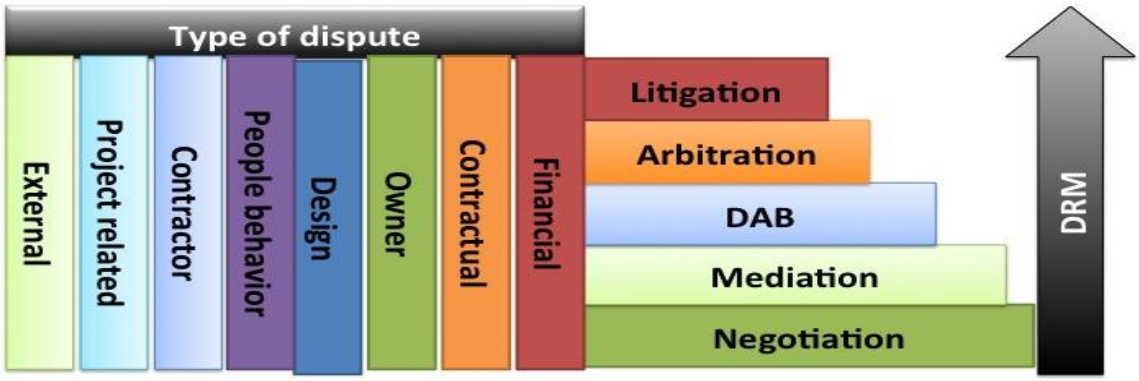


Figure 8-6: The relationship between financial, contractual, owner-related, design-related, people's behaviour-related, contractor-related, project-related and external disputes and method of dispute resolution

According to the data gathered for this study, financial disputes are settled through negotiation, mediation, DAB, arbitration and litigation; contractual disputes are settled through negotiation, mediation, DAB, arbitration and litigation; owner-related disputes are settled through negotiation, mediation, DAB, arbitration and litigation; design-related disputes are settled through through negotiation, mediation, DAB, arbitration and litigation; contractor-related disputes are settled through negotiation, mediation, DAB, arbitration and litigation; project-related are settled through negotiation, mediation, DAB, arbitration and litigation and, finally, external disputes are settled through negotiation, mediation, DAB, arbitration and litigation (Figure 8.6).

Through the analysis of quantitative data in Chapter 5, it has been identified that eight Types of Disputes' causes typically occur in Saudi construction projects, which are as follows: (financial, contractual, owner-related, design-related, people's behaviour related, contractor-, project-related and external disputes). In Chapter 6 (quantitative data analysis), participants were asked about the different types of dispute resolution that were used in the event of a conflict occurring in a construction project in Saudi Arabia. The participants answered that the dispute resolution method used were as follows: negotiation, mediation, arbitration, DAB and litigation.

8.6 The relationship between critical success factors for alternative dispute resolutions with method of dispute resolution

8.6.1 Introduction

This section describes the relationship between the critical success factors for alternative dispute resolution with the method of dispute resolution based on the data gathered for this study (see Chapter 6). This section is based on the order of the critical success factors for alternative dispute resolution given in Chapter 7. It is divided into two sections: the first section concerns the relationship between the critical success factors of alternative dispute resolutions and ADR and the second section is about the relationship between critical success factors of alternative dispute resolutions and litigation. There were eleven critical success factors for alternative dispute resolutions and five dispute resolution methods.

8.6.2 Critical success factors of alternative dispute resolutions' relationship with ADR

The development of this framework is based on the ISM method given in Chapter 7 and the relationship between critical success factors of alternative dispute resolutions and ADR. the ranking of the critical success factors of alternative dispute resolutions was as follows: speed, economy, flexibility, confidence, neutrality, fairness, maintaining relationships and privacy, psychological, reputation and being non-adversarial (where privacy is on the same level as psychological and reputation is on the same level as non-adversarial) (Figure 8.7).

Since the relationship of Critical Success Factors with ADR. For example: Methods of Dispute Resolution are alternative dispute resolution and litigation as alternatives disputes solutions are as follows: negotiation, mediation, arbitration and DAB. In Chapter 6 (quantitative data analysis), the order of participants' answers for the critical success factors (most important to least important) on the alternatives for dispute Resolution were as follows: (speed, economy, flexibility, confidence, neutrality, fairness, maintaining relationships and privacy, psychological, reputation and being non-adversarial).

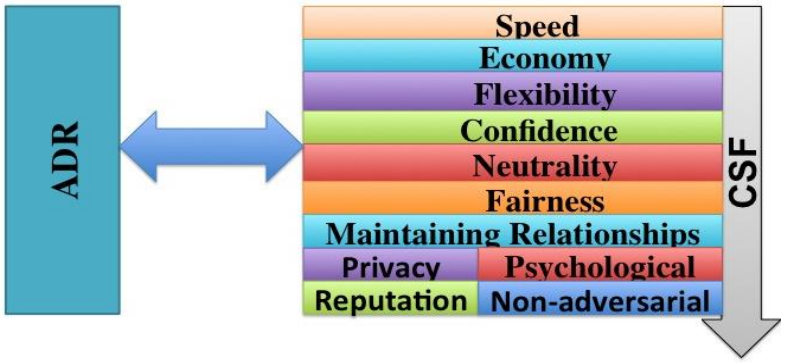


Figure 8-7: Critical success factors of alternative dispute resolutions' relationship with ADR

8.6.3 Critical success factors of alternative dispute resolutions' relationship with litigation

The relationship between the critical success factors of alternative dispute resolutions with litigation, contrary to negotiation, mediation, DAB and arbitration is ranked as follows: speed, economy, flexibility, confidence, neutrality, fairness, maintaining relationships and privacy, psychological, reputation and being non-adversarial (where privacy is on the same level as psychological and reputation is on the same level as non-adversarial). Speed and economy are the most important critical success factors of alternative dispute resolution in order to avoid litigation (Figure 8.8).

This figure illustrated the relationship between litigation method and critical success factors. These critical success factors were chosen in order to avoid the drawbacks of the use of litigation method.

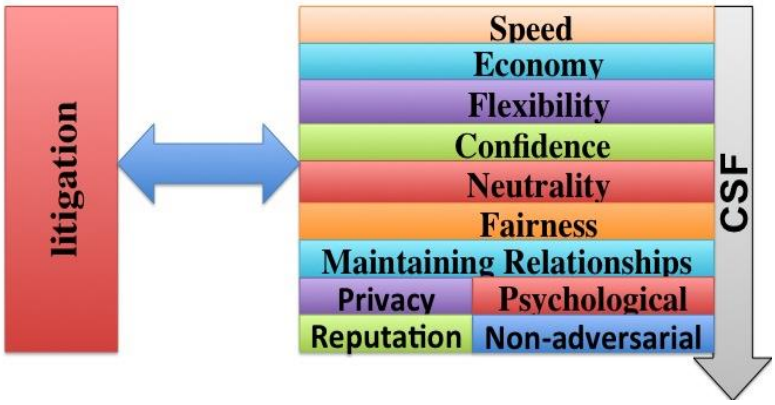


Figure 8-8: Critical success factors in alternative dispute resolutions' relationship with litigation

8.7 Dispute resolution framework

The framework to improve the efficiency of dispute resolution in Saudi construction projects consists of three columns. The first column concerns types of disputes, comprising eight categories ranked in the following order (from disputes which have the most impact to the least): financial disputes, contractual disputes, owner-related disputes, design-related disputes, disputes arising from people's behaviour, contractor-related disputes, project-related disputes and external disputes.

The second column describes the method of dispute resolution, comprising five methods of dispute resolution, ranked as follows: negotiation, mediation, DAB, arbitration and, finally, litigation. The methods of dispute resolution column is related to the previous column containing types of disputes and also has a relationship with the next column, which comprises the critical success factors of alternative dispute resolutions. This column consists of eleven factors ranked according to the importance of the critical success factor in terms of the method of dispute resolution, as follows: speed, economy, flexibility, confidence, neutrality, fairness, maintaining relationships and privacy, psychological, reputation and being non-adversarial (where privacy is on the same level as psychological and reputation is on the same level as non-adversarial). Speed and economy are the most important critical success factors of alternative dispute resolution in order to avoid litigation (Figure 8.9).

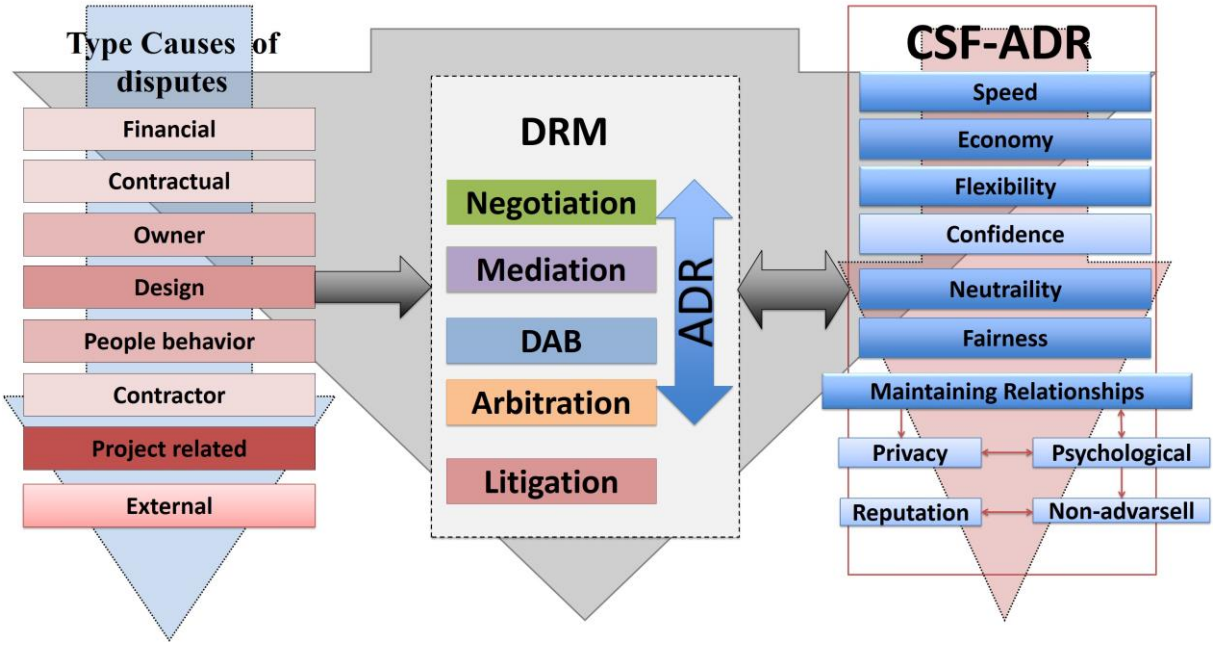


Figure 8-9: Dispute resolution framework

8.8 Framework validation

8.8.1 Introduction

At the stage where the understanding of the framework had to be ensured, a letter was sent through email and WhatsApp to 55 academics, arbitrators and experts to invite them to participate. The letter contained precise and condensed information about the development of a framework to improve the efficiency of dispute resolution in Saudi construction projects and potential participants were told that a presentation was available to explain the framework and clear up any questions they may have.

Thirteen academics, arbitrators and experts responded positively to the invitation to take part in an interview. All the people who responded had somehow been involved in construction project dispute resolution in Saudi Arabia and their experience was spread over 25 years. The average time allocated to each interview was half an hour. Some interviews took an hour, while others did not take more than fifteen minutes. The involvement of such a variety of participants, including academics, arbitrators and experts, was positive in terms of ensuring the understanding of the framework (Table 8.3).

Table 8-3: Interviewees' Profile

No	Code	Position	Time (mints)
1	A1	Arbitrators	**22**
2	A2	Arbitrators	**34**
3	A3	Arbitrators	**59**
4	A4	Arbitrators	**32**
5	AC1	Academics	**54**
6	AC2	Academics	**19**
7	AC3	Academics	**44**
8	E1	Experts	**24**
9	E2	Experts	**15**
10	E3	Experts	**18**
11	E4	Experts	**21**
12	E5	Experts	**45**
13	E6	Experts	**33**

8.8.2 Presentation

The framework was presented as an illustration of three different columns: the first column presented the types of disputes are in order of the dispute having the most impact, i.e. financial, contractual, design-related, people behaviour-related, contractor-related, project-related and disputes due to external issues. The second column presented the methods of dispute resolution i.e. negotiation, mediation, DAB, arbitration and, lastly, litigation. The third column presented the critical success factors of alternative dispute resolution, as follows: speed, economic, flexibility, confidence, neutrality, fairness, maintaining relationship, psychological, privacy and, finally, reputation and psychological (see Appendix 4). The results of the analysis are described below.

8.8.3 the results of the questionnaire

To ensure the accuracy of the framework, the participants were asked two specific sets of questions. The first set of questions was about the participants' profession, experience and whether they had ever participated into any dispute resolution. The second set consisted of five

questions which aimed to assess the participants' opinion about the data using a 5 point Likert Scale to evaluate their opinions of each statement.

- **Was the illustration clear to understand and were all the points covered?**

The majority of the participants indicated that the illustration was clear. Figure 8.10 shows that 92.13 % (n=12) of the participants agreed that the points made were comprehensive while 7.69 % (n=1) were neutral. The results illustrate that the majority of the participants understood the aim of the discussion.

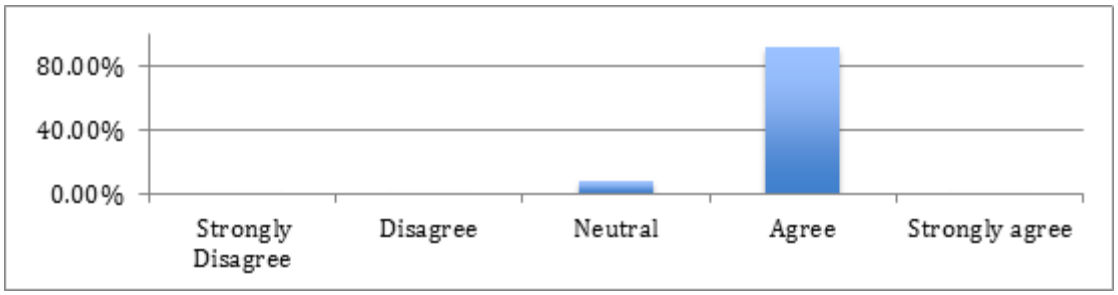


Figure 8-10: Level of understanding of the presentation

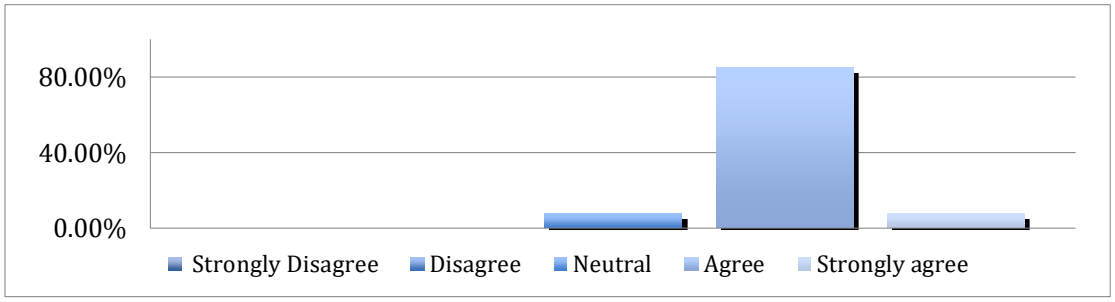


Figure 8-11: The outcome the types causes of disputes

- **Were the types causes of dispute presented in the framework was clear and easy to understand?**

Generally, the participants agreed that the types causes of disputes presented in the framework were accurate (Figure 8.11). The percentage of those who agreed was 84.62% (n=11). While the percentage of those who strongly agreed 7.79% (n=1).and who were neutral was 7.79% (n=1). Some participants' quotes are given below.

E5: “In our developing country, like in other developing countries, there are types of disputes and causes of disputes and regretfully we have not understood the impact of disputes over our projects and presenting the type of disputes in this way is good and clear for any reader.”

Ac2: “We need to understand and know the sources and types of disputes’ causes to work on them to resolve them in a better way.”

- **Was the arrangement of the type of dispute was clear and easy to understand?**

The majority of the participants was pleased that the arrangement of the types of disputes within the framework was accurate. Figure 8.12 illustrates that 76.92% (n=10) agreed with the ranking of the type of dispute while15.38 % (n=2) strongly agreed and only 7.69% (n=1) were neutral. A participants’ quote is given below.

E3: “I can see that the type of disputes, their causes and their labels were overlapping and the explanation and categorisation was clear."

- **Were the results of the dispute resolution method given in framework was clear and easy to understand?**

All of the participants were satisfied with the ranking of the dispute resolutions methods given within the framework. Figure 8.13 illustrates that 23.08% (n=3) of participants strongly agree, and 76.92% (n=10) agree.

Ac2 pointed out that: “The mediation dispute resolution method could also be seen as being conciliatory at the same time. However, if it is going to be used in this way in the public and private sectors, projects will never stop due to disputes.

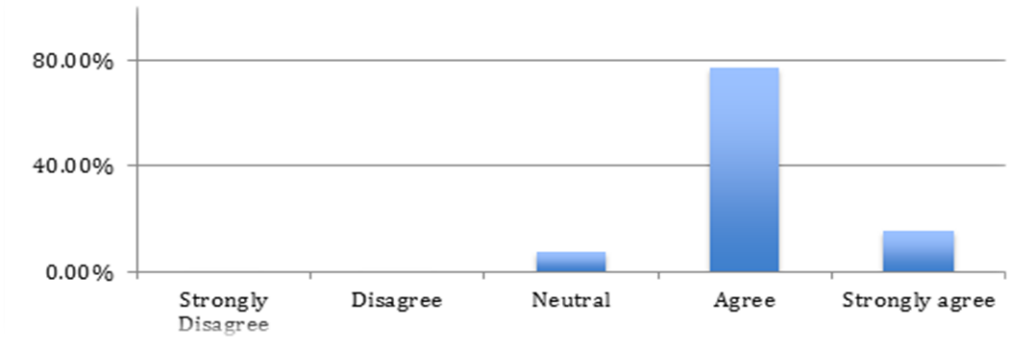


Figure 8-12: The types causes of disputes

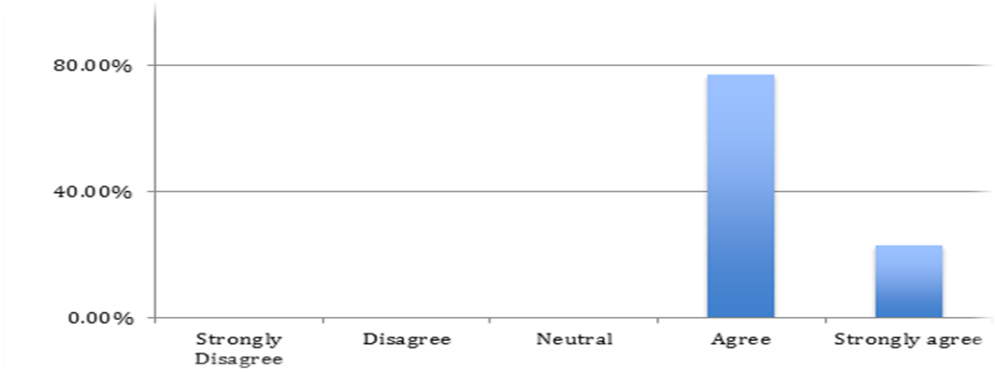


Figure 8-13: The dispute resolution method

- **Was the arrangement of the dispute resolutions method in the framework was clear and easy to understand?**

The Figure 8.14 illustrates that the majority of the participants agreed that the ranking of the dispute resolution in the framework was accurate. The percentage of those who were strongly in agreement was 38.46 % (n=5), while the percentage of those who agreed was 53.85% (n=7). The percentage of those who remained neutral was 7.69% (n=1). The following are some participants' views:

A1: "The DAB method of dispute resolution should be used from the beginning of the project to the end but to put the DAB before arbitration and after mediation would be more suitable".

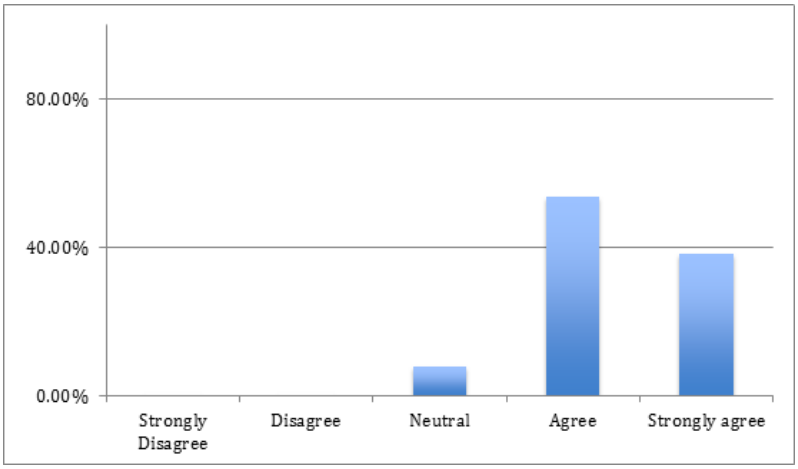


Figure 8-14: The arrangement of the method of dispute resolutions

- **Were the results and the arrangement of the critical success factors for the alternative dispute resolution in framework was clear and easy to understand?**

All of the participants were satisfied with the results and arrangement of the critical success factors relating to the resolution of the disputes. Figure 8-15 illustrates that the percentage of the participants who strongly agree with the result was 23.08% (n=3) while the percentage of those who agree was 76.92% (n=10).

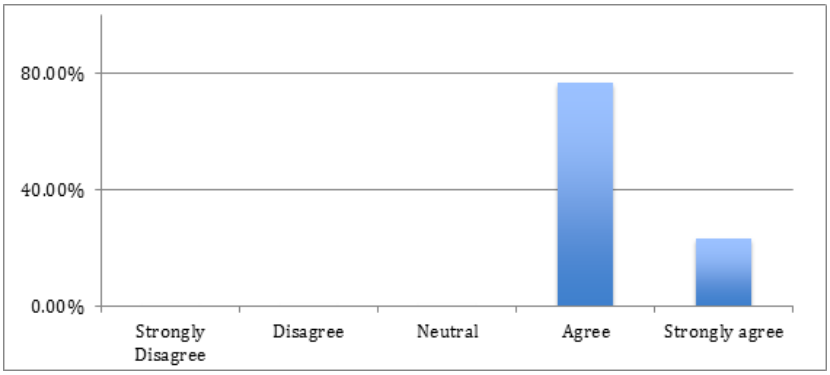


Figure 8-15: The outcome and arrangement of the critical success factors for ADR

- **Were the relationships between type of dispute and method of dispute resolution was clear and easy to understand?**

All of the participants either agreed or strongly agreed that the types of disputes that affect the methods of dispute resolution methods are negotiation, mediation, DAB, arbitration and

litigation. Figure 8-16 illustrates that the percentage of participants who strongly agreed with the result was 23.08% (n=5) while the percentage of those who agreed was 76.92% (n=8).

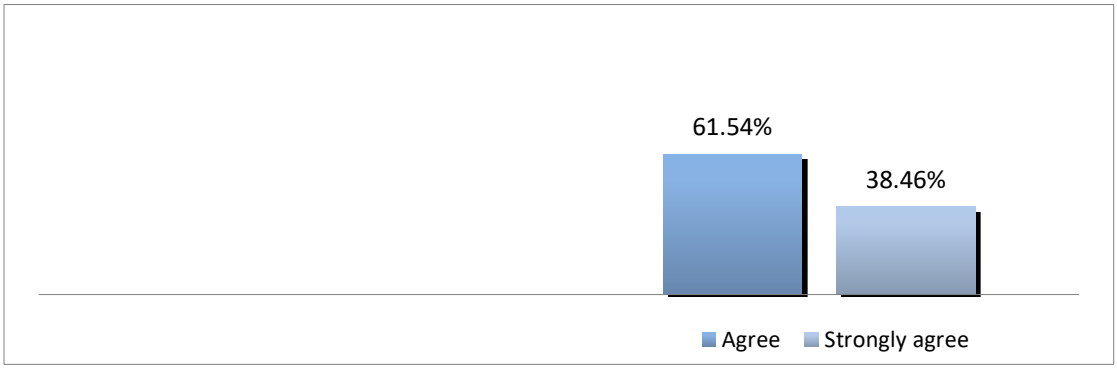


Figure 8-16: the relationships between type causes of disputes and method of dispute resolution

- **Were the relationships between the method of dispute resolution and the critical success factors for ADR was clear and easy to understand?**

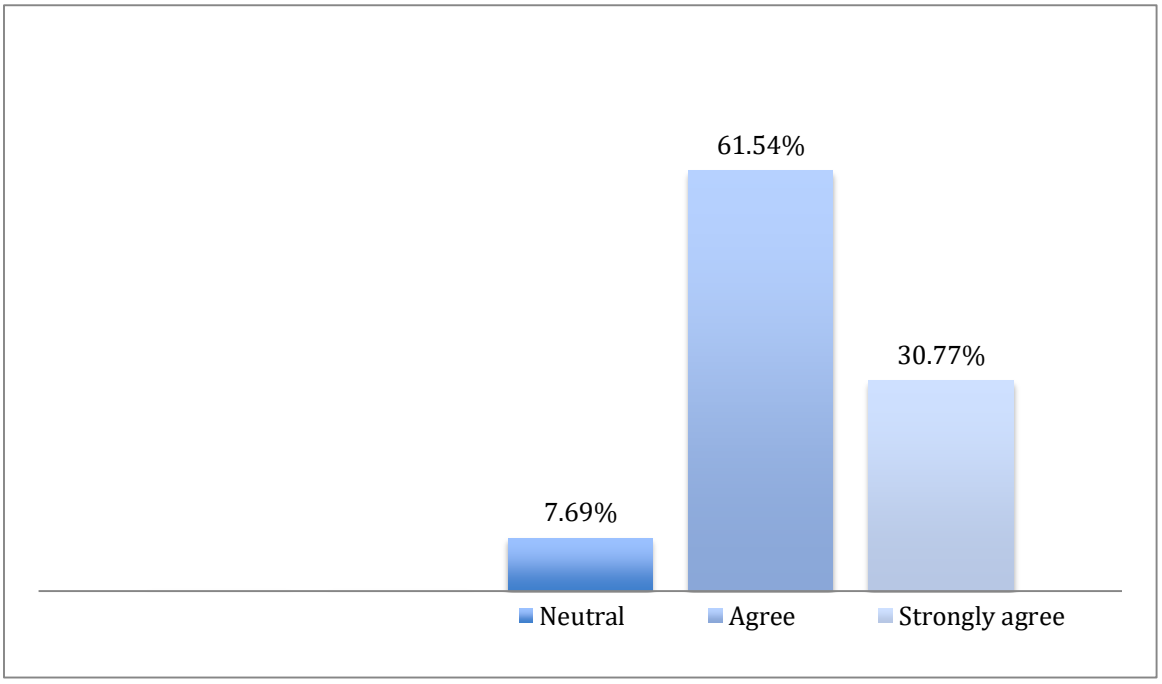


Figure 8-17: the relationships between dispute resolution method and alternative dispute resolution

The majority of the participants agreed that the relationships exchangeable participants disagreed and said some factors may not affect the methods of dispute resolution. Figure 8.17 illustrates that 76.92% (n=8) agreed with the ranking of the type of dispute while 15.38% (n=4) strongly agreed and only 7.69% (n=1) were impartial. A participants' quote is given below.

- **To what extent should the proposed framework be applied to construction projects in Saudi Arabia?**

Figure 8.18 illustrates that 61.54% (n=8) of the participants strongly agree and 23.08 % (n=3) agree that it is possible to implement the framework, while the percentage of those who were neutral was 15.38 % (n=2). The participants made the following points:

Participant A1: "Regretfully, inadequate attention has been paid by government to alternative dispute resolution methods and arbitration. The center of arbitration is established and that is considered as being a great step. But it has been implemented too late, although the center of arbitration is under the chamber of commerce umbrella by the council of ministers' bill, arbitration is not being encouraged by the government."

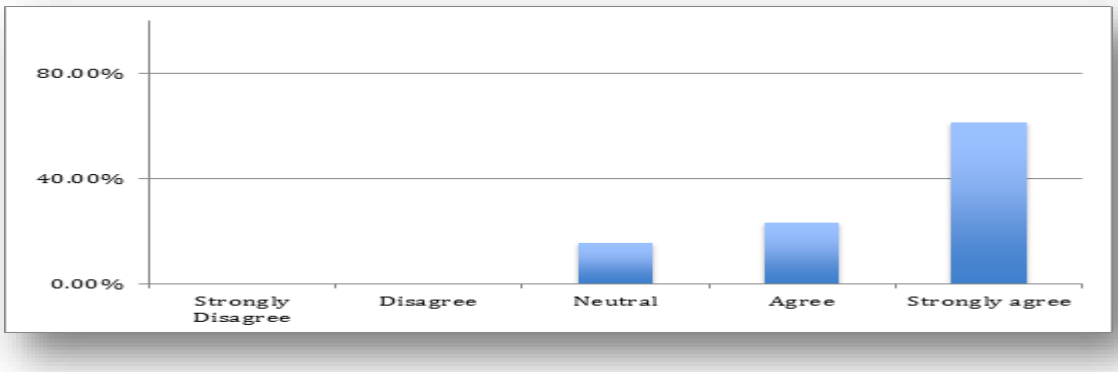


Figure 8-18: The applied proposed dispute resolution framework in Saudi Arabia

Participant E3: "New rules need to be set up to implement this framework and make effective use of it. The public and private sectors need to start working with alternative methods of dispute resolution."

Participant A2: "To implement this alternative dispute resolution framework in Saudi Arabia requires a cultural change and increased awareness in society and personnel participating in the dispute resolution."

The framework was developed as part of the dispute resolution system in Saudi construction projects, see (Figure 8.9), as this dispute resolution framework helps the arbitrators, experts and engineers, as well as the parties of the disputes in Saudi construction projects to obtain the best

dispute resolution method commensurate with the types of disputes that occur in the public and private sector.

this framework consists of three columns

The first column represents the type of causes of disputes in SCP. Where the type of disputes and their effect on the dispute resolution method starts from negotiation, mediation, DAB, arbitration and litigation. This is the case for all types of disputes. The second column represents dispute resolution, and is divided into ADR and litigation. Dispute resolution by negotiation can affect speed and other factors. For example, a dispute that is resolved through negotiation could take less than one month.

The third column refers to the critical success factors which are involved in the dispute resolution method. The ADR is selected according to critical success factors. For example, the parties involved in disputes may have different opinions towards the dispute resolution method adopted, based on critical success factors. Some parties may find that their confidence factor is high in the litigation method, whereas other parties may find it is low.

8.9 Conclusion

This chapter provided the suggested framework to improve the efficiency of dispute resolution in Saudi construction projects. The final framework consists of three columns: the first column comprises the types of dispute, the second column comprises the dispute resolution method and last column comprises the critical success factors of alternative dispute resolution. The accuracy of the framework was assessed by a group of academics, arbitrators and experts in Saudi construction projects. Their response was generally positive and they supported the framework.

Chapter 9. Discussion, Recommendation and Conclusion

9.1 Introduction

The purpose of this thesis is to develop a dispute resolution framework to improve the efficiency of dispute resolution in Saudi construction projects. The objectives were achieved by answering the research questions. Achieving answers for the research questions is based on: an overview of the literature, the results of quantitative and qualitative, framework development and the evaluation and validation of the framework.

- First, the researcher reviewed the literature to develop and determine in-depth understanding of the effects and causes of disputes as well as the methods of dispute resolution in Saudi construction projects in terms of which have been identified. The researcher highlighted critical successful factors for alternative dispute resolution, as well as barriers to using an alternative dispute resolution in Saudi construction projects in the public and private sectors.
- Second, the researcher described the research methodology that was designed to illustrate the method used in this research and where we used a mixed mode of approach.
- Third, qualitative and quantitative data had performed to detect and know the types and causes of disputes, determine the order and understand the relationships between the types and causes of disputes with methods of dispute resolution and to examine the critical successful factors and also the barriers that prevent its use in Saudi construction projects.
- Fourth, the researcher developed a framework based on some of the results of the literature review and also qualitative and quantitative data.
- Fifth, the framework was evaluated and validated as well as by the academics, experts and arbitrators in Saudi construction projects.
- Finally, the researcher discussed the results of this thesis and make recommendations to the industrial sector and researchers, as well as identify the points that contributed to the research.

9.2 Research objectives achievement

This section achieve the aim “is to develop a dispute resolution framework to improve the efficiency of resolving disputes in Saudi construction projects” though the achieve this

objectives the discussion was divided into six objectives following:

Objective 1 To identify the impact of disputes and types and causes of disputes in Saudi construction projects.

Objective 2 To explore the existing practice of the methods of dispute resolution in Saudi construction projects.

Objective 3 To investigate critical success factors for alternative dispute resolution and barriers to alternative dispute resolution usage to solve disputes in Saudi construction projects.

Objective 4 To develop a dispute resolution framework to improve the efficiency of methods of dispute resolution in Saudi construction projects.

Objective 5 To evaluate and validate the dispute resolution framework in Saudi construction projects through ISM and academics', arbitrators' and experts' feedback.

Objective 6 To provide recommendations on the best method of dispute resolution in Saudi construction projects.

Objective 1: To identify the impact of disputes and Types of Disputes' causes in Saudi construction projects.

The researchers conducted a comprehensive study of the literature as well as undertaking collection of data and analysis on the effects of disputes and the types and causes of disputes in Saudi construction projects; as this objective that contributed in this study provided ranking and rating between factors based on the quantitative data which conducted with 327 responds and discussed this objective of the following research:

- Impact of disputes in Saudi construction projects.

  The achievement of this objective "To identify the impact of disputes and Types of Disputes' causes in Saudi construction projects."

  Based on data analysis, it is indicated that the participants that agree in terms of disputes' dangers consider the impact of disputes in Saudi construction projects upon "Time" to be very high with proportions was above 93%, while the proportion

of participants who agree that impact of disputes on "Cost" is in second position and was above 82%. "Quality" stands in the third position with the proportion of agree being 72% and also still high.

The literature indicates that the Middle East is the region of the world reporting the highest levels of cost disputes in the construction industry compared to the UK, Europe, the USA and Asia (Allen et al., 2012), Researchers in the United Arab Emirates further report that disputes and claims can equate to 15% of a building project's value (Zaneldin, 2002). Compared to all industries, the construction industry loses the most time out of work as a result of industrial disputes (Australian Bureau of Statistics, 2010). Furthermore, a study of the Australian construction industry by Blake (2006) found that the most significant contributing factors to disputes are schedule and cost overruns. In construction projects, disputes can result in a time-consuming, unpleasant and expensive experience for all parties involved (Fenn, 2007). Overall, the underlying causes of construction project disputes are related to the cost, quality, time and safety, which are often the main objectives in any project (Fenn and Gameson, 1991; Kumaraswamy, 1998).

- Types and causes of disputes in Saudi construction projects.

Based on interview analysis, these can be divided eight categories as follows: financial disputes, contractual, owner, design, people behavior, contractor, project related and finally external disputes. The participants were asked about the ranking of types and causes of disputes in Saudi construction projects, and it was found that the types and causes of disputes are classified into eight categories as follows: Financial, Contractual, Owner, Design, People's behavior, Contractor, Project-related and External.

Financial disputes has the highest proportion of all: 60%. Meanwhile, we conclude that External disputes has the least proportion of types and causes of disputes, and that was 20%. Next to this comes the types and causes of disputes with less importance, which are Project-related disputes and External disputes, which are not over 30%, where the Project-related is 30% and the External disputes is 20%. The literature indicates that although numerous researchers have focused on the different causes of disputes, a certain level of commonality between the causes exists (Cakmak and Cakmak, 2013). Thus, it is essential to classify the common causes of disputes into different groups. They can be classified into seven broad

categories, based on the nature and mode of occurrence (Cakmak and Cakmak, 2013). Fenn (1997) and (2006) conducted comprehensive studies on previous research based on the cause of disputes in the construction industry. Furthermore, Acharya and Lee (2006) divided the causes of conflicts into five groups: owner, contractor, consultant and third party, other, as per the conflict initiator. Elziny (2015) divided causes into Financial Issues, Contract Management, Contract Documents, Project-related Issues and Other Reasons, and Helen (2007) divided them in this way: structure, process, people, external and internal disputes. Cakmak (2013) made the following divisions: owner-related disputes, contractor-related disputes, design-related disputes, contract-related disputes, human-behavior-related disputes, project-related disputes and external factors.

It became clear that there are five causes of financial disputes as follows: "late payment", "inadequate financial planning for the project", "delay in acquiring approval", "increased price of the materials" and "wrong calculation". The highest proportion of financial dispute is "late payment". It is 64%. The lowest proportion is for "wrong calculation" with a proportion of 27%. The literature indicates that in the UK (Conlin et al., 1996) payment and budget are causes of disputes.

From the data analysis, the most effective cause of dispute in contractual projects is "use of contracts incorrectly", and its proportion is 64%. Next to that stands "breach of contracts" with a proportion of 63%. After this comes "the absence of the contract content", whose proportion is 61%. The proportion of the following causes of disputes gradually drops as follows: "low bid", 59%; "failure to manage contracts", 55%; "discrepancy in the interpretation of contracts", 41%; "risk allocation", 37%. We can see that the least proportion belongs to the cause of dispute in contractual issue, which is titled "risk allocation". Its proportion is 37%. As the literature indicates, regarding the situation in Hong Kong, Kumaraswamy (1997) tried to determine the reasons and differentiate the root causes from other factors. Some of the common root causes in the construction project sector claims include unfair risk distribution and inadequate contract paperwork (Rosenfeld, 2014). Premature tender documents, definitions and use of the traditional procurement method are causes of disputes in Saudi Arabia (Assaf and Al-Hejji 2005) The most common reason for delay is the lowest bid.

From the data analysis, the highest causes of dispute in "owner" are three categories and are

as follows: the use of the "change orders", 65%; verbal orders, 60%; owner uncooperative, 56%. In Australia, Fenn (1991) said that there are variations in the causes of disputes. The literature also indicates changes in owners' requirements, changes and alterations and adjustments (Rosenfeld, 2014; Zaneldin, 2006; and Daoud and Azzam 1999).

From the data analysis, the highest causes of dispute in "design" are design error, 53% and "inadequate design", 47%, where there was not a big difference in percentages between the two causes. The literature indicates (Kumaraswamy, 1997) incorrect design information that causes from other factors and Fenn (1991) Designs of contracts.

From the data analysis, among the most important causes of disputes in Saudi construction projects under "people behavior" was poor communication; it was 61%. The literature indicates that in the USA (Diekmann and Nelson, 1985) causes of disputes USA People issues and also the causes of disputes that Poor communication (Kumaraswamy, 1997).

From the data analysis, among the causes under contractor's disputes, the one which has the highest proportion of is "efficiency of contractor", 78%. "Poor implementation" has the highest proportion among the other causes, and that proportion is 72%. After that, there is the delay of achievement, 68%; then finally Meanwhile we conclude that "the difficulty of access to the site" has the least proportion of causes of contractor's dispute, and that is 24%. The literature indicates involve poor site investigation (Kumaraswamy, 1997), performance and quality (Conlin et al., 1996), inefficiency in the working process and doubt attached to the project completion (Mitropolous and Howell, 2001).

From the data analysis, the highest cause of project-related disputes was "document is not enough" according to participants, with a proportion of 80%. "Inadequate delivery of materials for the project" stands in second position with a proportion of 70%. The literature indicates inadequate contract paperwork (Kumaraswamy, 1997) and inadequacy of material to be used in construction (Arditi et al., 1985) and issues related to pitiful documentation (Daoud and Azzam, 1999).

Finally, from the data analysis, among the causes of external disputes in Saudi construction projects, "unexpected weather" was 44%. In Canada, a cause of disputes was that the weather was "cold" (Semple et al., 1994).

Objective 2: To explore the existing practice of the methods of dispute resolution in Saudi construction projects.

This objective that contributed is this study explored the current methods of dispute resolution in Saudi construction projects based on qualitative data, which conduct on 15 experts, arbitrators and academics. Based on the data analysis, it has been recorded that there are five DRM for dispute resolution in Saudi construction projects. They are ranked as best method to resolve disputes as follows: negotiation 80%, mediation 60% and the Dispute Adjudication Board (DAB) 50% respectively. The method of dispute resolution called DAB is a special state where it starts from the beginning of the project and continues until the end of it. After that, the lower-ranked methods of dispute resolution are arbitration, 30%, and litigation, 20%. According to Murdoch and Hughes (2008), there are three predominant categories of dispute resolution techniques in the construction industry. These are litigation, arbitration and alternative dispute resolution (ADR), a technique that allows parties to come to a settlement based on their own negotiations, rather than that of third parties. The DAB was formulated by the international construction industry, as a response to the reported ineffectiveness of current arbitration practices in providing both an adequate and cost-effective way of resolving disputes (Seifert, 2005).

Considering that the four different approaches to *DRM* are litigation, negotiation, arbitration and mediation, the length of time that each approach takes is as follows, according to the data analysis. The vast majority (72%) said that negotiation takes less than a month, while mediation takes from one to three months, according to 60%, and arbitration takes four to six months, according to 51%. Finally, 63% said that litigation takes one to three years. Research by Lyer et al. (2008) in India revealed that, on average, it takes between five and 15 years to reach an adequate resolution in court.

Based on the data analysis, the methods of dispute resolution in Saudi construction projects are as follows: negotiation, mediation, arbitration and litigation. The levels of education of the participants are as follows: the highest percentage of the cost for participants the litigation is 100% after that arbitration cost is 64% after that the mediation was not exceed 33% the cost did finally the negotiation is not exceed 22%. According to Cheung et al. (2010), the increasing costs that are a result of arbitration or litigation have attracted wide agreement. Such costs include not only the charges to be paid out in the settlement but also other financial losses

sustained while deciding a construction dispute (Gebken et al., 2005), which could be very costly for the losing party (Li et al., 2013). For Cheung et al. (2000), in order to improve the effectiveness of project organization, one approach is vital to reduce such non-value-adding costs.

Objective 3: To investigate critical success factors for alternative dispute resolution and barriers to alternative dispute resolution usage to solve disputes in Saudi construction projects.

- **This objectie has been divided into two parts:**

Critical success factors for alternative dispute resolution.

This objective that contributed in this study provided CSF ISM model that contributed to the understanding of the relationship between critical successful factors for alternative dispute solutions in Saudi construction projects. Based on data analysis, the first most effect critical success factors to all of the participants as speed was 100%, and the highest most factors are three critical success factors above 80% economy is 80%, flexibility is 80% and confidence is 80% after that the less most factors are three factors was above 70%, neutrality is 75%, fairness is 73% and maintaining relationships is 70%, respectively. We notice that the less effect critical success factors to all of the participants are two factors less than 30% as non-adversarial is 20% and reputation is 28% then lowest factors less than 70% are two factors psychological is 60%, privacy is 60%, respectively.

In ADR, there are overt factors that are associated with mediation and negotiation. These include flexibility and fair proceeding speed (Chong and Zin, 2012). York (1996) further stated that cost, time, relationship preservation, binding decisions, procedural flexibilities, confidentiality and control are critical success factors of ADR. This can be attributed to the fact that they are less expensive and are a faster method of resolving disputes in a way that does not engender adversarial relationships (Harmon, 2001; Harmon, 2002). Further studies in Nigeria found that in ADR procedures, negotiation is the highest-ranking factor of success, given that it generates savings to both cost and time and improves working relationships (Isa, Rasheed and Emuze, 2015). The study of Lu, Zhang and Pan (2015) also found that reputation, cooperation and trust, time, judgment execution and emotion are the five main critical success factors of ADR, whereas the study of Cheung (1999) found that low cost, relationship

preservation and speedy resolution are the critical success factors of ADR. Common ADR features ranked as critical success factors by both neutral parties and ADR users include the preservation of the business relationship, neutrality, fairness, enforceability, cost to obtain and speed to obtain (Cheung et al., 2004). In the past, impartiality and consent have both been cited as critical success factors to ADR procedures (Davis, 1988). This can be attributed to the fact that they are less expensive and are a faster method for resolving disputes in a way that does not engender adversarial relationships (Harmon, 2001; Harmon, 2002).

Barriers to alternative dispute resolution usage to solve disputes in Saudi construction projects.

This objective that contributed this study provided ranking and rating between factors based on the quantitative data which conduct with 327 responds Based on interview data analysis, the four categories of barriers preventing resolving disputes in Saudi construction projects are contractual, governmental, cultural, and development and rehabilitation. These were given by participants as owners, contractors and consultants. The major barrier to all of the participants is the "governmental barrier". The highest from most participants was 51.28. The highest barrier is contractual; then it is followed by the governmental barrier and the proportion given to it is 35%. Then comes the cultural barrier, and the proportion given to it is 30.95%. Finally, the smallest development and rehabilitation barrier proportion was of 13%. Research into construction mediation in the UK lists a number of barriers to alternative dispute resolution including lack of social awareness and disputatious culture (Abdullah, 2015). A further study in Kuwait found that a lack of mediation awareness and cultural concerns towards mediation use further posed a barrier to alternative dispute resolution. As such, these matters were found to be the predominant barriers to employment mediation for construction disputes in Kuwait (Gharib et al., 2011).

Objective 4: To develop a dispute resolution framework.

The aim of this study to develop a dispute resolution framework to increase the efficiency of methods of dispute resolution in Saudi construction projects in terms of dependence on the literature review and the opinions of academics, arbitrators and experts, which will have a significant role in this. This objective that contributed of dispute resolution framework is to improve efficiency of dispute resolution in Saudi Construction Projects. Through the types and

causes of disputes and methods of dispute resolution as well as the critical success factors for alternative dispute resolution that have been studied and explored through a literature review, interviews and surveys with academics, experts and arbitrators where the achievement of this objective through the following:

1. There are eight types and causes of disputes: financial disputes, contractual disputes, owner-related disputes, design-related disputes, disputes arising from people's behaviour, contractor-related disputes, project-related disputes and external disputes.
2. There are five methods of dispute resolution: negotiations, mediation, DAB, arbitration and litigation.
3. There are 11 critical success factors for alternative dispute resolution: speed, economy, flexibility, confidence, neutrality, fairness, maintaining relationships and privacy, psychological, reputation and being non-adversarial.

There are 11 barriers to using an alternative dispute resolution in Saudi construction projects, the most important of which are lack of an officially imposed ADR by government in SCP, absence of a clause in the contract of Public Works that allows the use of an alternative dispute resolution in construction projects, adversary culture, lack of awareness, lack of adequate experience of arbitrators and engineers, lack of knowledge on implementing an ADR (project management, legal departments), lack of trust on ADR, lack of knowledge of judges and lawyers in how to deal with an ADR, lack of knowledge price of ADR, lack of establishing an engineering arbitration center and an ADR for solving disputes, and finally, lack of adequate experience of arbitrators and experts.

Objective 5: To evaluate and validate the dispute resolution framework.

The expository technique used was structural modeling (ISM) to evaluate the model of the 11 critical success factors for alternative dispute resolution that is part from the dispute resolution framework in Saudi construction projects the second part the used interview framework with academics, experts and arbitrators to validate the achieve dispute resolution framework in Saudi construction project which follows:

- **To evaluate critical success factors for alternative dispute resolution.**

The present ISM model from data can help dispute resolution in Saudi Arabian construction

projects through understanding the interaction of 11 critical success factors affecting alternative dispute resolutions, and assist in providing decision makers with a realistic picture to deal with disputes and resolutions. They were asked about 11 successful factors that connect their common relationship. The sample consists of nine levels, which are illustrated in figure 7.1. This figure shows the two most important factors starting from the bottom (9), which is speed; the alternative to the dispute solutions should be effective in terms of speed, and disputes and must be resolved and ended in a short time. Next to that stands level 8, which consists of the economic factor; the dispute solutions must have less cost.

Nishat et al. (2006) used the ISM method to represent the interrelationships found between various elements linked to a particular problem. ISM was further deployed by Lin et al. (2011) in order to understand the causal interrelationships of a vendor performance evaluation framework.

- **To validate the dispute resolution framework in Saudi construction projects.**

1. More than 80% of academics, experts and arbitrators agreed that the types and causes of disputes in Saudi construction projects presented in the framework were accurate and right.
2. The majority of the participants agreed that the ranking of the method of dispute resolution in the framework was accurate and right. The percentage of those who were strongly in agreement was 91%.
3. All of the academics, experts and arbitrators agreed with the result of the critical success factors for alternative dispute resolution.
4. More than 84% of the academics, experts and arbitrators agreed that it is possible to implement the dispute resolution framework in Saudi construction projects.

9.2.6 Objective 6: To provide recommendations on the best method of dispute resolution.

Recommendations in the industry in the Kingdom of Saudi Arabia could be divided into four sections, based on the interviews with 15 academics, arbitrators and experts exceeding 25 years, as follows:

- **Recommendations for Saudi construction projects (SCP).**

The development of a disputes resolution framework can help the public and private sectors in Saudi Arabia in general, in determining the types and causes of disputes, the critical success factors for alternative dispute resolution and how to deal with methods of dispute resolution through the dispute resolution framework in Saudi construction projects for all parties involved in disputes.

- **Recommendations for the SCE.**

The development of a disputes resolution framework can help the SCE and especially the Engineering Arbitration Center through more identification of the types and causes of disputes, the critical success factors for alternative dispute resolution and how to deal with methods of dispute resolution through the dispute resolution framework, which sets out for the SCE's Engineering Arbitration Center five methods of dispute resolution that it is possible to apply in Saudi Arabia, in addition to the arbitration method of dispute resolution.

- **Ministry of Justice.**

The development of a disputes resolution framework in Saudi Arabia could help the Justice Department in dispute resolution as the Kingdom of Saudi Arabia has characterise Islamic and culture, and all the arbitrators who were interviewed had a sharia background as well as practical experience through the critical success factors for alternative dispute resolution, such as speed, economy and flexibility, how to deal with disputes and find out method of disputes framework which provide time, effort and cost to the judges and lawyers in the Justice Department where the framework In applied case.

- **Ministry of Commerce (Saudi Chamber of Commerce (SCC)).**

The development of a disputes resolution framework in Saudi Arabia could help the Ministry of Commerce and especially the Saudi Chamber of Commerce (SCC)). Dispute resolution Department have as many foreign traders have not encouraged at work in the trade sector in Saudi Arabia because of the traditional method of disputes resolution in the case that the trader foreign work in the trade sector in Saudi Arabia may resort foreign Traders centers external dispute resolution in the case face disputes as well as major local trades over foreign centers to dispute resolution. It is possible that this framework, which is based on research in this field,

will give confidence to local and foreign traders by knowing and defining the methods of dispute resolution through identifying types and sources of disputes and the critical success factors for alternative dispute resolution.

9.3 Contribution to knowledge

Through the search results it produced, this study contributed to knowledge in areas of interest as follows: First, this study provided a deep understanding of the effects of disputes and the types and causes of disputes in Saudi construction projects. Second, this study revealed the current methods of dispute resolution in Saudi construction projects, which could be used in similar cases. Third, it enabled the development of a deeper understanding of the critical success factors for alternative dispute resolution, as well as barriers to the use of alternative dispute resolution in Saudi construction projects. Fourth, it provided a model that contributed to the understanding of the relationship between critical successful factors for alternative dispute solutions in construction projects.

The contributions and outcomes achieved by this study helped to identify the type and sources of disputes in construction projects .The common causes and identify the categories of disputes based on the nature and mode of occurrence (Cakmak and Cakmak, 2013) also, this research provided a contribution towards exploring dispute resolution method in construction projects in the public and private sectors. The method of disputes resolution in the public sector was litigation .The average dispute resolution in the court takes between five and fifteen years to achieve a resolution in the court. (Lyer et al., 2008), while the method of disputes resolution in the private sector was through alternative disputes resolution (There are three categories of dispute resolution techniques in the construction industry, (i) litigation, (ii) arbitration and (iii) alternative dispute resolution (ADR) (Murdoch and Hughes, 2008). Also, this research provided a contribution towards finding the critical success factors on alternative dispute solutions in construction projects. In addition, it highlighted the challenges that prevented the use of alternative dispute resolution in construction projects, with the most important of those being public obstacles .The five main critical success factors of ADR are reputation, trust, time, judgment execution and emotion (Lu, Zhang and Pan, 2015). Also, the impact of disputes over time, cost and quality were highlighted despite the challenges confronted in alternative dispute solutions in construction projects. Research into construction mediation in the UK list a number of barriers which can be grouped into six categories; (i) lack of social awareness, (ii) a business

culture of dispute litigation, (iii) insufficient planning and preparation, concerning the awareness of ADR strategies, (iv) process barriers, (v) lack of security and trust, and (vi) the availability of adjudication processes (Abdullah, 2015). It was also observed that the disputes resolution framework in construction projects helped in preserving time, cost and also the relationship between the parties involved in the dispute because disputes in constructions can have an impact on In UK study the most significant contributing factors to disputes are schedule and cost overruns Black, 2014).

9.4 Limitations

Despite the achievement of previous objectives during the study, there were limitations to the research:

- The lack of research on dispute resolution in construction projects, especially in Saudi Arabia.
- It was very difficult to access the arbitrators, academics and experts, as most of them have senior positions in the government or in their own business where they are based. used on my of a network of relationships to make contact with them.
- The arbitrators and academics and experts they don't have time it was a difficult time with meet interviewee with them as some of them refused to meet duties by the lack of time.
- This research is the first of its kind in Saudi Arabia, where the aim was to develop a framework for improving the efficiency of dispute resolution in Saudi construction projects.
- This study focused on construction projects in the Kingdom of Saudi Arabia. However, it is possible to make use of them in other countries that have similar characteristics to those of the Kingdom.

9.5 Future research

Here are some of the recommendations of this study with respect by the disputes in engineering construction projects FOLLOWS where the best research in these areas:

- Find a relationship between the types and causes of disputes with the methods of dispute resolution by using computer software to provide more valuable and useful results to researchers.

- Empirical study on methods of dispute resolution in Saudi construction projects of these methods alone, for example, the negotiation, mediation and arbitration.
- Study the relationship between the critical success factors for alternative dispute resolution in construction projects with barriers to using the alternative dispute resolution.

9.6 Conclusion

The seriousness of the impact of disputes on construction projects in general, and especially in Saudi construction projects in terms of cost, time and quality, as well as the impact on the relations between the parties in the disputes, was the main motivation for me as a researcher. Studies have proven that as the trend for heavy expenditure in the construction sector in Asia and the Middle East is likely to continue for years to come, the possibility of a high volume of disputes cannot be overruled (Allen et al., 2013).Jannadia (2000) investigated different types of disputes prevalent in KSA. He concluded that disputes have become increasingly common since the 1980s. As well as the quantitative and qualitative data found from the participants, more than 94.19% approve the dangers of disputes in Saudi construction projects. This is a very high proportion.

The main objective of this research is to develop a framework to improve efficiency in dispute resolution in Saudi construction projects. Where they can benefit on this dispute resolution framework for alternative dispute resolution in Saudi construction projects in the public and private sector, where they were to achieve to achieve that 6 objectives through these chapters: from review the literature (ch2, ch3), the outline research methodology (ch4), qualitative and quantitative data (ch5, ch6), the development of a framework and evaluated and validate framework (ch7, ch8) Finally, the discussed, recommendations and conclusion (ch9).

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Appendix 1

University of Salford MANCHESTER

Research, Innovation and Academic Engagement Ethical Approval Panel

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19 October 2015

Dear Saad,

RE: ETHICS APPLICATION CST15/39 – To Develop Alternative Dispute Resolution Framework to Reduce Disputes Occurrence within KSA Public Sector Construction Projects

Based on the information you provided, I am pleased to inform you that application CST 15/39 has been approved.

If there are any changes to the project and/ or its methodology, please inform the Panel as soon as possible by contacting S&T-ResearchEthics@salford.ac.uk

Yours sincerely,

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Chair of the Science & Technology Research Ethics Panel
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Appendex2

"Interview Guide"

Section (1): Specific information about the interviewee

1. Your name is:

2. What is your background?

3- how many cases have you participants on it?

Section (2): The impact of Disputes on the Construction Project

In this section, the Interviews were questioned based on their experiences, whether disputes will have impact on Saudi construction project? Explain?

Section (3): Type Causes of Disputes in Saudi Construction Project

What are the type causes of disputes in Saudi construction project? Explain?

Section (4): Method of Disputes resolution in Saudi Construction Project

What are the Method of Disputes resolution in Saudi Construction Project? Explain?

Section (5): Alternative Disputes resolution in Saudi Construction Project

1-What are the Critical Success Factors for Alternative Disputes resolution in Saudi Construction Project?

2- what are The barriers Using Alternative Disputes resolution in Saudi Construction Project?

3-What are the ADR that can be used in Saudi Construction Project in Future?

Appendex3

"The Questionnaire"

This questionnaire is the completion of a PhD thesis. The aim of this discussion is "to develop dispute resolution framework to improve efficiency of resolving disputes in Saudi construction projects."

Answering all the questions in this questionnaire will not take more than 10 minutes. Therefore we would appreciate if you could spare the time to fill it.

We are grateful that you have allocated part of your time to fill this questionnaire.

Part One:

General information about the participant:

1-Are you from Saudi Arabia:

Yes No

2- Have you confronted any disputes in the Saudi Construction Project you have been involved in:

Always Very Often Sometimes Rarely Never

3- Have you taken part in solving any disputes in the projects, which you have been involved in**:**

Always Very Often Sometimes Rarely Never

4-How would you classify yourself in the Saudi Council of Engineers**:**

Engineer Partner Professional Consultant

5-Years of experience**:**

(1 To 5 years) (6 to 10 years) (11 to 15 years) (16 to 20 years) (More than 20 years)

6-What is your expertise؟

(Civil engineer) (Architect) (Electrical Engineer) (Mechanical Engineer) (Other)

7-What has been your functional status in most of the projects which you have taken part in:

Owner Consultant Contractor Others

8-In which department do you work in:

Public sector Private sector both sectors

9-Educational level:

Bachelor's Degree Master's Degree Ph.D. High diploma

Part Two:

Disputes in Saudi construction projects:

There is no doubt that disputes in Saudi construction projects pause a real threat, which might result in the shutdown of the venture.

10-Do you agree that disputes are dangers to construction projects in Saudi Arabia?

Strongly Agree Agree Neutral Disagree Strongly Disagree

11-Are you satisfied with the disputes resolution method in Saudi construction project?

Very satisfied Satisfied Neither Dissatisfied Very dissatisfied

Part Three:

Effect of disputes in Saudi construction projects, on Time, Cost and Quality:

12-To what extent do you agree that disputes in saudi construction projects affect the following?

Time (Strongly Agree Agree Undecided Disagree Strongly Disagree)

Cost **(**Strongly Agree Agree Undecided Disagree Strongly Disagree)

Quality **(**Strongly Agree Agree Undecided Disagree Strongly Disagree)

Part Four: The reasons for disputes in engineering construction projects:

13- Disputes on "Financial issues"; have a significant effect on Saudi construction projects. What is the most significant effect of the following causes of disputes?

1-Late payment

2-Inadequate financial planning for the project.

3-Delay in acquiring approval.

4- Increased price of the materials.

5-Miscalculations.

14-Disputes on issues related to "Contractual issues" influence the Saudi construction projects to a great extent. What is the most significant effect of the following causes of disputes?

1- Ambiguous contractual documents.

2-Breach of contract.

3-Incorrect use of contract.

4- low bids

5- failure to manage contracts.

6-Discrepancy in the interpretation of contracts.

7- Risk allocation.

15-Disputes on issues related to "*owner*" influence the Saudi construction projects to a great extent. What is the most significant effect of the following causes of disputes?

1-Change orders.

2- Verbal orders.

3-Owner uncooperative.

4- Failure of the owner in relationship building.

5-Exaggerate the business request from the contractor.

16-Disputes on issues related to "*Design*" influence the engineering construction projects to a great extent. What is the most significant effect of the following causes of disputes?

1-Design error.

2- Inadequate design.

17-Disputes on issues related to "*people behaviour*" influence the engineering construction projects to a great extent. What is the most significant effect of the following causes of disputes?

1- Failures in decision-making.

2- Poor communication.

3-Lack of experience.

4- Lack of knowledge.

5-Lack of team spirit.

6-Lack of motivation.

18-Disputes on issues related to "*Contractor*" influence the engineering construction projects to a great extent. What is the most significant effect of the following causes of disputes?

1-Efficiency contractor.

2-Poor implementation.

3-Delay of achievement.

4-Lack of competence of the participants in the project.

5- Manpower is insufficient.

6- Monitoring and control of the site is incorrect.

7-Difficulty of access to the site.

19-Disputes on issues related to "*Project related*" influence the engineering construction projects to a great extent. What is the most significant effect of the following causes of disputes?

1- Document is not enough.

2- Delivery of materials.

3- Weakness of programmes.

20-Disputes on issues related to "*External*" influence the Saudi construction projects to a great extent. What is the most significant effect of the following causes of disputes?

1-Higher change policy.

2- Unexpected weather.

21-Disputes influence the Saudi construction projects to a great extent. Which one of the following issues is more significant?

1. Financial issues.

2. Contractual issues.

3. Owner issues.

4. Design issues.

5-People behaviour issues.

6- Contractor issues.

7-Project related issues.

8. External issues.

Part Five:

Method of disputes resolution in Saudi Construction Project

22-To what extent these solutions are used to solve disputes in the private sector?

1. Negotiation

(Almost always Often Sometimes Seldom Never)

2.Mediation

(Almost always Often Sometimes Seldom Never)

3.Arbitration

(Almost always Often Sometimes Seldom Never)

4.Litigation

(Almost always Often Sometimes Seldom Never)

Part Six: (Section one)

23-How long each of the following methods will take to solve disputes in Saudi construction projects

1. Negotiation

(0-1month) (1-3 months) (3-6 months) (6-12 months) (1-3 years) (3-5 years) (More than 5 yearss

2. Mediation

(0-1month) (1-3 months) (3-6 months) (6-12 months) (1-3 years) (3-5 years) (More than 5 years)

3. DAB

(0-1month) (1-3 months) (3-6 months) (6-12 months) (1-3 years) (3-5 years) (More than 5 years)

4. Arbitration

(0-1month) (1-3 months) (3-6 months) (6-12 months) (1-3 years) (3-5 years) (More than 5 years).

5. Litigation

(0-1month) (1-3 months) (3-6 months) (6-12 months) (1-3 years) (3-5 years) (More than 5 years)

24-To what extent do you agree that the costs of solving disputes in engineering construction by the following methods are staggering:

1. Negotiation

(Strongly Agree Agree Undecided Disagree Strongly Disagree)

2. Mediation

(Strongly Agree Agree Undecided Disagree Strongly Disagree)

3. DAB

(Strongly Agree Agree Undecided Disagree Strongly Disagree)

4. Arbitration

(Strongly Agree Agree Undecided Disagree Strongly Disagree)

5. Litigation

(Strongly Agree Agree Undecided Disagree Strongly Disagree)

25- What is the most important critical success factor for alternative dispute resolution in Saudi Construction Projects?(Rank)

1-Speed

2-Economy

3-flexibility

4-Confidence

5-Neutrality

6-Fairness.

7-Maintaining relationships

8- Privacy

9-Psychological

10- Reputation

11- Non-adversarial

Part Seven:

26- what are the most important culture barriers that prevent the use of Alternative dispute resolution in Saudi Construction Project?.(Rank)

1-Adversarial culture.

2- Lack of awareness.

3-Lack of knowledge on implementing ADR (PM, legal departments).

4-Lack of trust of ADR.

5-Lack of knowledge from judges and lawyers on how to deal with ADR.

6-Lack of knowledge about the price of ADR.

27- what are the most important barriers that prevent the use of Alternative dispute resolution in Saudi Construction Project? (Rank)

1-Lack of establishment of arbitration centres and ADR.

2-lack of experience from arbitrations and experts.

3-Lack of education.

28-what is the most important barriers that prevent the use of Alternative dispute resolution in Saudi Construction Project? (Rank)

1-Lack of officially imposed ADR by government in Saudi Construction Project.

2-Absence of a clause in the contract of Public Works which allows the use of ADR in construction projects.

3- Adversary culture.

4-Lack of awareness.

5-Lack of adequate experience of arbitrators and engineers.

6- Lack of knowledge on implementing ADR (project management, legal departments).

7-Lack of trust on ADR.

8-Lack of knowledge from judges and lawyers on how to deal with ADR .

9-Lack of knowledge about the price of ADR.

10-Lack of establishing engineering arbitration centres.

11- ADR for solving disputes.

12-Lack of experience of arbitrators and experts.

Part Seven:

29- What is the best Dispute Resolution method can be used with the financial disputes? (Rank)

a. Negotiation
b. Mediation
c. Arbitration
d. Litigation

30- What is the best Dispute Resolution method can be used with the Contractual disputes? (Rank)

a. Negotiation
b. Mediation
c. Arbitration
d. Litigation

31-What is the best Dispute Resolution method can be used with disputes related to the *Owner issues.*? (Rank)

a. Negotiation
b. Mediation
c. Arbitration
d. Litigation

32-What is the best Dispute Resolution method can be used with the Design disputes?

a. Negotiation
b. Mediation
c. Arbitration
d. Litigation

33-What is the best Dispute Resolution method can be used with the *People behaviour* disputes? (Rank)

a. Negotiation
b. Mediation
c. Arbitration
d. Litigation

34-What is the best Dispute Resolution method can be used with the *contractor* disputes? (Rank)

- Negotiation
- Mediation

- Arbitration
- Litigation

35-What is the best Dispute Resolution method can be used with the *project related* disputes? (Rank)

- Negotiation
- Mediation
  Arbitration
- Litigation

36-*What is the best Dispute Resolution method can be used with the External disputes?* (Rank)

- Negotiation
- Mediation
- Arbitration
- Litigation

37- What is the best dispute resolution method that can be application in Saudi construction project? (Rank)

1-Negotiation.
2- Mediation.
3-DAB.
4-Arbitration.
5-Litigation.

Appendix4

"Framework validation"

1-Was the illustration clear to understand and were all the points covered?

2-Were the types causes of dispute presented in the framework accurate?

3-Was the arrangement of the type of dispute accurate?

4-Were the results of the dispute resolution method given in framework accurate?

5-Was the arrangement of the dispute resolutions method in the framework accurate?

6-Were the results and the arrangement of the critical success factors for the alternative dispute resolution in framework accurate?

7-Were the relationships between type of dispute and method of dispute resolution accurate?

8-Were the relationships between the method of dispute resolution and the critical success factors for ADR accurate?

9-To what extent should the proposed framework be applied to construction projects in Saudi Arabia?